AMERICAN ARTISAN

OCTOBER 1949
69th Year

ESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

n This Issue

News Round-Up. Page

The President's fact ding board advanced the estion of pensions to the int where all American siness ponders the prob- m. This month's editorial scusses several aspects of nsions. Page 65.

Your old customers ould be the easiest pros- cts to sell. If you have t them, find out how to t 'em back. Page 71.

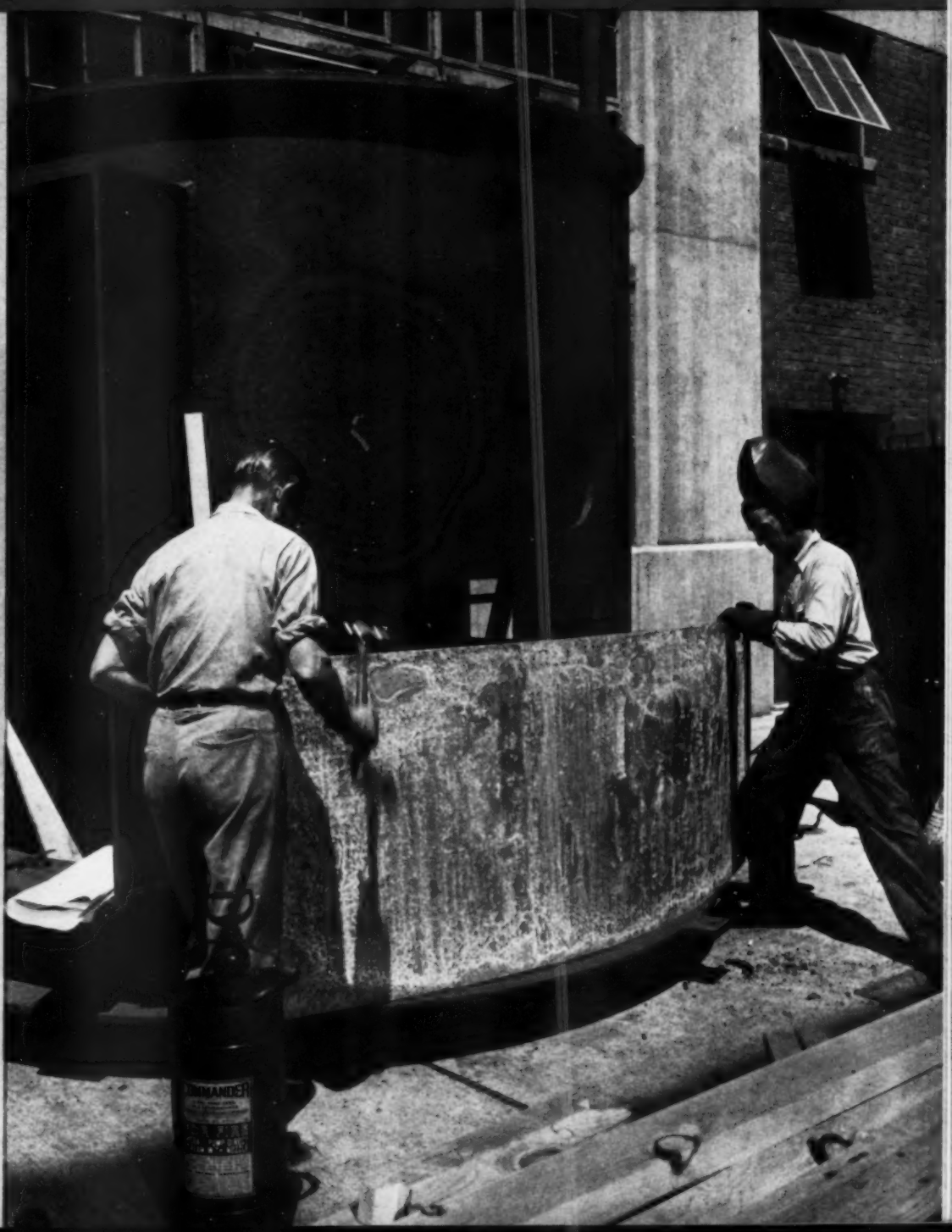
Professor Konzo an- ers many questions about rimeter heating on Page

Seven steps for adjust- heating plants for Con- uous Air Circulation are Page 82.

Advance planning can crease the profit on flash- masonry walls. Some uable tips are in the ar- le starting on Page 91.

The Cover Picture

eet metal workers plac- the sheathing on a ting chamber at the S. Naval Gun Factory ich is celebrating its 0th anniversary. See ge 96.



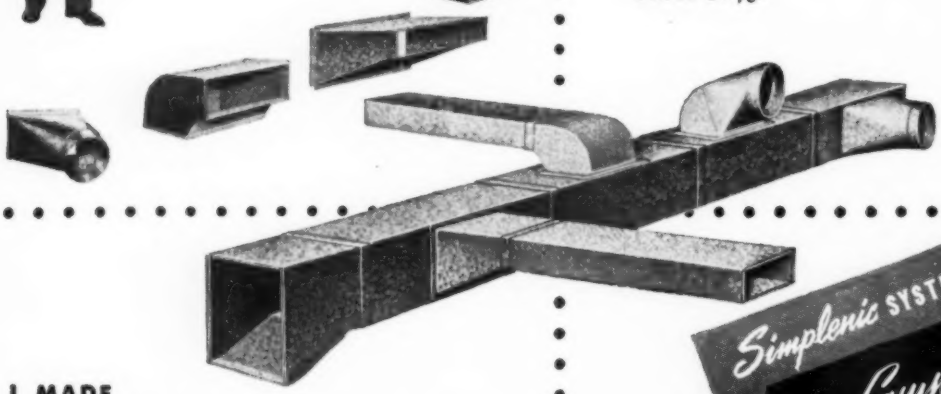
With the Simplenic System I underbid my competition and make more profit at the same time!

**TOUGH JOBS—
EASY JOBS—
IT ONLY TAKES FOUR**

That's right — I only use 4 type duct fittings on any job. That's big economy number one.

**THIS SAVES ME 25%
ON MATERIAL**

Simplenic streamlined main trunk needs no increasers or reducers. How's that for a labor saver, too. I figure about 30%.



**I MADE
'EM PROVE IT!**

On one job I used my old method — on another job the Simplenic. The Simplenic job figured faster — finished faster, and that meant real extra profit for me.

Write for free comprehensive catalog and name of your nearest jobber.

CLAYTON & LAMBERT MFG. CO.
LOUISVILLE 10, KENTUCKY

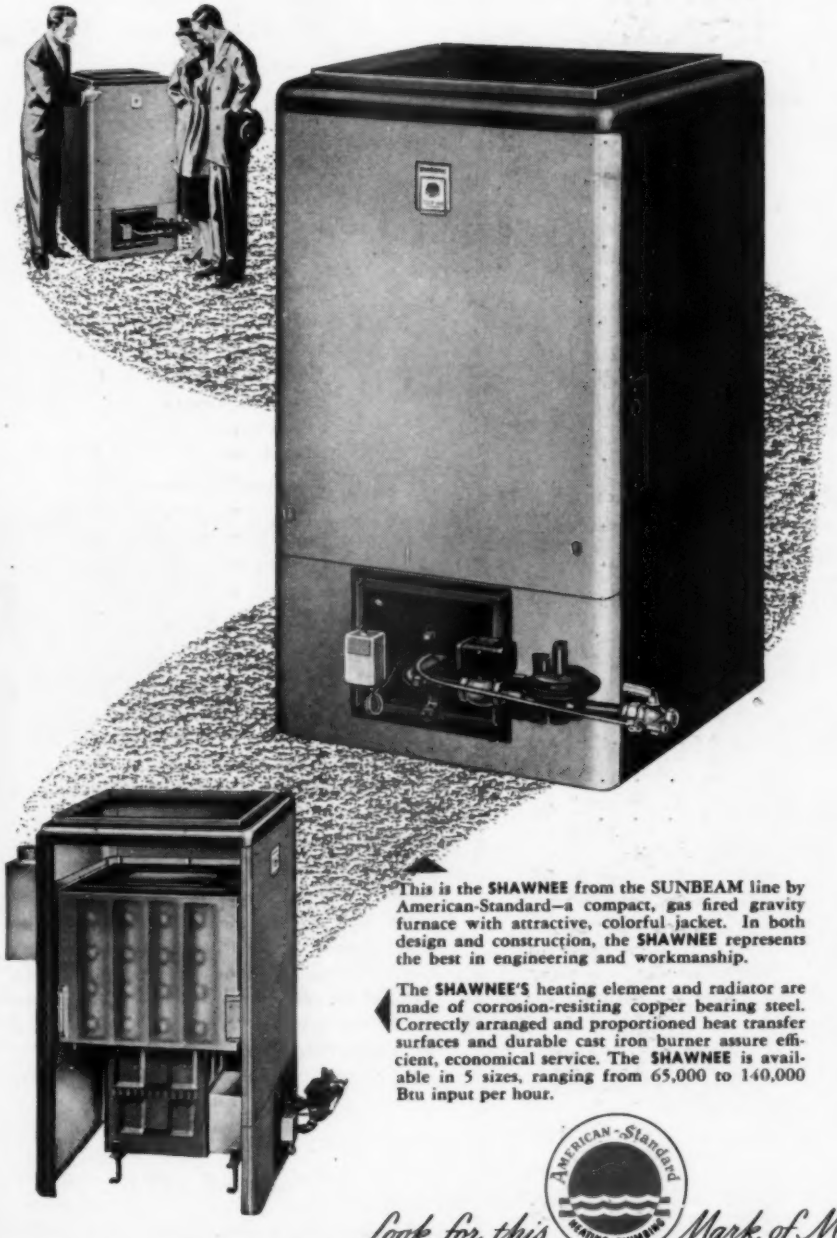
LAMNECK ANOTHER GREAT C&L PRODUCT

AMERICAN-Standard

First in heating . . . first in plumbing

You sell satisfaction when you sell

AMERICAN-Standard heating equipment



This is the **SHAWNEE** from the SUNBEAM line by American-Standard—a compact, gas fired gravity furnace with attractive, colorful jacket. In both design and construction, the **SHAWNEE** represents the best in engineering and workmanship.

The **SHAWNEE'S** heating element and radiator are made of corrosion-resisting copper bearing steel. Correctly arranged and proportioned heat transfer surfaces and durable cast iron burner assure efficient, economical service. The **SHAWNEE** is available in 5 sizes, ranging from 65,000 to 140,000 Btu input per hour.

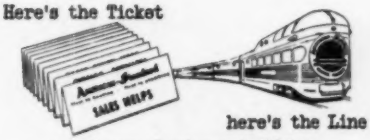
■ Good heating equipment goes a long way towards making satisfied customers. That's why it's good business to sell only products of unquestioned quality.

In the field of residential heating equipment, no name is more favorably known than American-Standard. And it is easy to understand why. For back of the widely advertised American-Standard name is more than half a century of broad manufacturing experience plus production and research facilities that are second to none.

Not only does American-Standard give you the finest quality that money can buy, but it's also a dependable source for all types of warm air furnaces and winter air conditioners, with a complete range of units for practically any installation.

For detailed information about the complete line, contact your Wholesale Distributor. **American Radiator & Standard Sanitary Corporation,** P. O. Box 1226, Pittsburgh 30, Pennsylvania.

Here's the Ticket



here's the Line

-to better business in '49!

When you sell American-Standard products you get all the selling aids you need to bring in more business. Ask your Wholesale Distributor for details of this powerful new advertising and merchandising program.

Look for this AMERICAN-Standard HEATING PLUMBING *Mark of Merit*

Serving home and industry

AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILER • ROSS HEATER • TONAWANDA IRON

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

Member—Audit Bureau of Circulations
Member—Associated Business Papers

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Founded 1880

OCTOBER 1949

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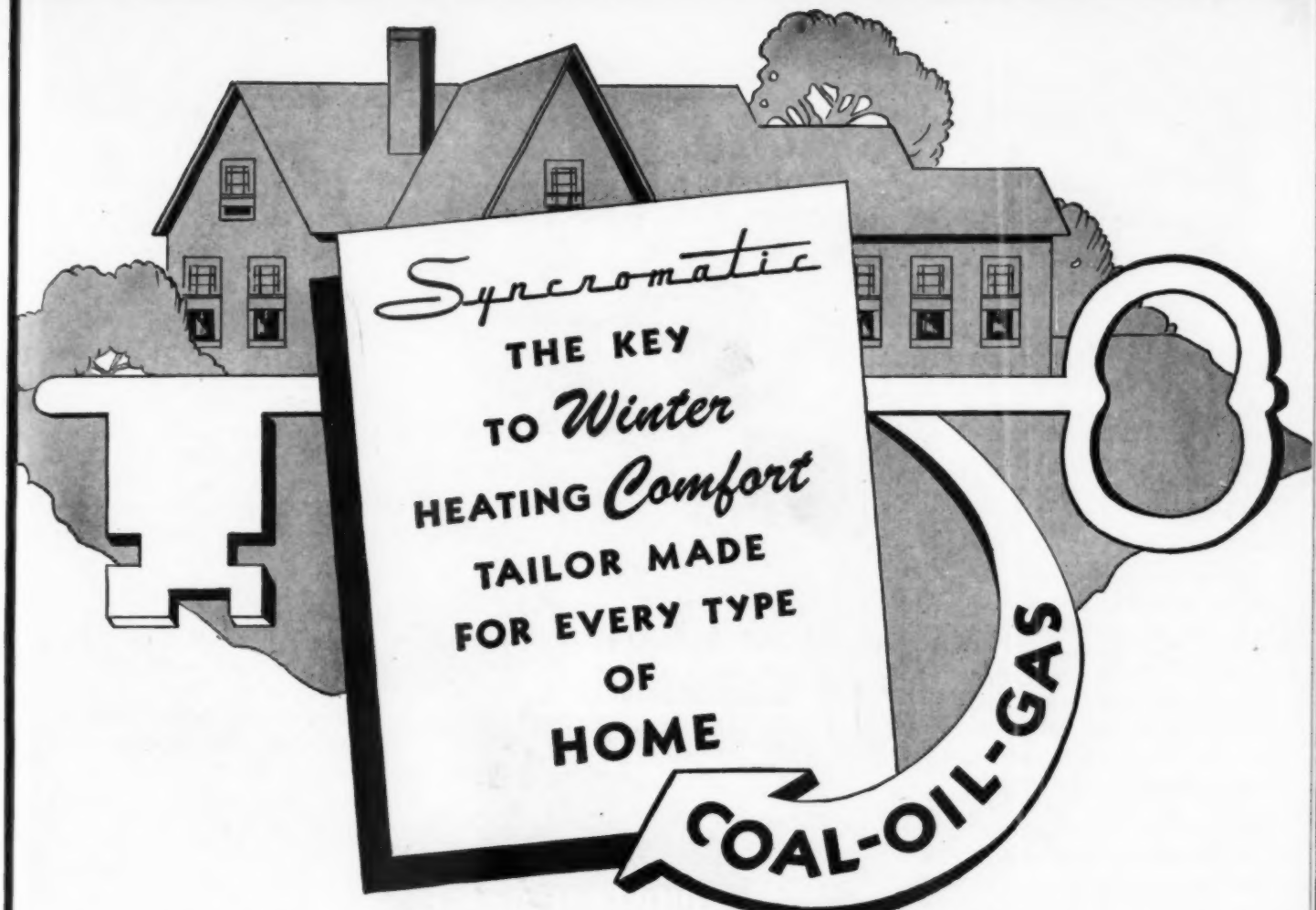
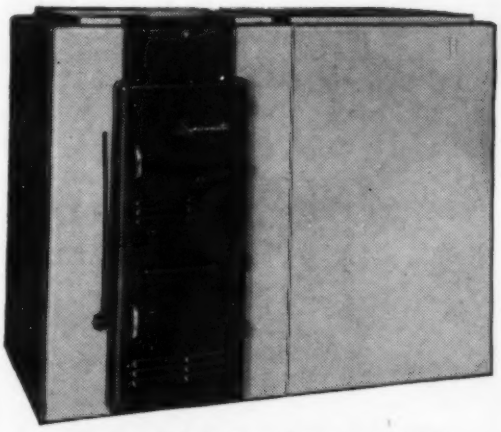


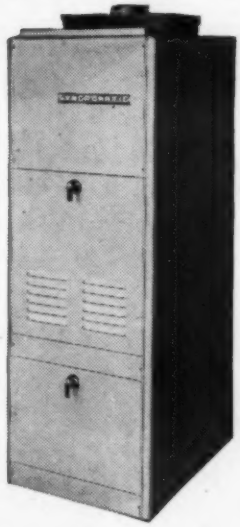
CFB COAL FIRED UNIT

Only Syncromatic has this design . . . the result of intelligent and logical application of the "COUNTER-FLOW" principle and a completely and unparalleled Front construction . . . GROUND FIT DOORS COMBINED WITH VENTILATED STEEL CABINET SHIELD. The only coal unit made that can be converted to high efficiency oil firing.



GFB GAS FIRED UNIT

A complete range from 75,000 to 240,000 BTU. All heat exchangers built of heavy 10 gauge corrosion resisting steel. "COUNTER-FLOW" principle as used in all Syncromatic Furnace Units.



Syncromatic COUNTER FLOW

COUNTER FLOW PRINCIPLE MEANS PERFECTION IN HEATING EFFICIENCY

OFB OIL FIRED UNIT

The Syncromatic Oil Fired Unit employs the "COUNTER-FLOW" principle in warm air heating . . . one of the most efficient methods of heat transfer known. Compact and completely welded heavy gauge heat exchanger . . . your best insurance for safety and long life. Just compare the gauge and construction of Syncromatic with any other oil-fired unit.

Syncromatic Corporation

WATERTOWN, WISCONSIN

the editor's notebook

Beg Your Pardon

In our August issue, Dr. A. Nemethy, author of the article entitled Heated By the Sun, was incorrectly identified as a member of the staff of Massachusetts Institute of Technology.

We hasten to correct the error by stating that the author is not associated with MIT. Dr. Nemethy, who holds a degree in agricultural engineering and a Ph. D. in economics, is engaged in consulting work which includes participation in the experiments at the Dover Sun House. In addition, Dr. Nemethy is currently teaching at Boston College.

Sound Engineering

As the result of a recent study, service engineers of GMC Truck & Coach Division of General Motors have reduced the noises made by a "vehicle in distress" to seven basic sounds, thereby alleviating the confusion of mechanics called upon to find the source of trouble. Although the study was made primarily to aid fleet operators of trucks to report noises accurately, M. D. Douglas, general manager, suggests that the public might benefit from acquiring a standard vocabulary for describing noises.

All of which has set us to wondering if heating contractors might not benefit from classifying furnace noises in a similar way. When a customer calls to complain that the heating system is emitting some strange sound, the service man should find it helpful to ask the customer which of the basic sounds comes closest to describing the noise. An accurate description would facilitate locating the trouble by acting as a sort of signpost. Certain noises would point to trouble in one part of the system while a niose of a different character would lead the engineer to an entirely different area.

As a starter for your noise vocabulary, the seven basic sounds as classified by GMC are the squeak, rattle, thump, grind, knock, scrape, and hiss. Perhaps some slight changes would have to be made in this list for the heating industry, but a standard vocabulary could be developed.

Why not give it a try and let us know about the results?

Heating Progress

E. W. Craw & Son, Juniata, Altoona, Pa., sheet metal and heating contractors, had one of the outstanding floats in the Altoona Centennial Parade held during the first week in August.

The float depicted the 41 year history of the firm which was founded by Mr. and Mrs. Edward W. Craw who are still active in its management. The mobile display mounted on a company truck, compared

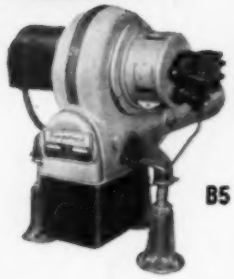
Here is a sure-fire formula for successful selling:
HW plus HW plus HW equals Success
HW stands for Hard Work, Head Work, and Heart Work!

Sundstrand
OIL BURNERS

• Flange mounted
• Variable tube lengths to fit your particular requirements

ALL SURFACES MACHINED
PRECISION MADE THROUGHOUT
COMPLETELY FIRE TESTED

the "CUSTOM-BUILT" LINE for forty-nine



meet all local and state requirements

WRITE US FOR COMPLETE INFORMATION
SUNDSTRAND ENGINEERING CO.
ROCKFORD • ILLINOIS

VISIBLE ALL ANGLES
Clear, all-proof, shatter-proof plastic. Tested 25 lb. pressure.
LEVEL TELL
Visible from both sides and end of tank.
VENT PIPE OPENING
Vent pipe screws in here.
NO LEAK
Threaded fit
VENTALARM GAUGE ®
For 275 gal. cellar tanks. State depth.
SIZES
2" x 1¼"
1½" x 1¼"
MALE THREAD
Screws into tank vent opening as usual.
TRADE LIST PRICE COMPLETE
$2.70
SIGNAL WHISTLE STEM
Projects into tank in usual manner.
GAUGE ARM
Strong steel rod stock.
GAUGE ARM HOLDER
Strong, rugged cold rolled steel rod.
NOJAM PIVOT POINTS
Foolproof pinned joints.
FLEXO-JOINT
Flexible, coil spring insert, is self-aligning. Bends, then straightens itself out. Allows easy installation regardless of amount of oil in tank.
ALWAYS FLOA
Coated cork.

"It looks like a hot number!"

That's what we said last May when we first advertised this new unit combining

VENTALARM® SIGNAL and a TANK GAUGE

But we didn't know how hot! Things had begun to get warm around the time of the National Oil Show in Boston this year when many of you actually saw the VENTALARM GAUGE. You saw how easily it could be screwed into the vent opening of a tank; how easy it was to read the gauge from all angles.

THEN THE SAVING OF ABOUT $2.00 PER BURNER INSTALLATION that comes with VENTALARM GAUGE really started the temperature rising and demand took a sharp upswing. It's a saving that's easy to figure. Instead of buying two items, you buy only one. There's $1.00 saved right there. The VENTALARM case acts as a reducer from 2" or 1½" tank opening to 1¼" vent pipe, so you save an additional 25c by eliminating need for reducing bushing. There's a saving in labor because you install one item instead of three. Then again, you need one less tank flange opening. So you save 30c to 40c on your tank order specification. A real money saver!

Apologies to those of you who had to wait for your initial order. We hope "them days are gone forever." Production has been increased and we're all ready for you.

VENTALARM GAUGE is available for 275 Basement Tanks with depths of 22", 24", 26", 27", 42", 44", and 47". Specify tank depth and opening when ordering.

YOUR JOBBER has VENTALARM GAUGE along with the other VENTALARM Signals he now carries.

Fully protected by U.S. and Foreign patents.

SCULLY SIGNAL COMPANY

72 First St., Cambridge 41, Mass.

Canadian Licensee: EMPIRE BRASS MFG. CO., LTD., London, Ontario

the editor's notebook

the old and the new by showing a modern gas fired winter air conditioning system in contrast with an 80 year old pedestal type warm air register. The float was designed by LeRoy W. Craw, son and partner of the founder.

To complete the historical cycle, most of the actual construction was done by LeRoy W. Craw, Jr., and Vernon E. Craw, sons of LeRoy Craw, who represent the third generation in this progressive firm. They were assisted by Daniel Leonard and William Miner, two of the company's employees.

Pessimists should be quarantined before an epidemic of depression sweeps over American business.

This Summer's Heat Wave

When the frosting on the cake was getting thinner this summer, many enterprising dealers bolstered sales by selling fans.

The sweltering public now recognizes the cooling comfort of generous air circulation. Fan sales soared during the past summer. Make 'em big and give 'em plenty of air in the summer is the principle that did it.

There is quite some difference between buying an 8 in. fan at the corner drug store and an adequately sized unit from a competent dealer who understands the air changes that cooling comfort requires.

Consolation

Here's a cheery note for those long hours of labor when you feel you're just a slave and all you do is work, work, work. Not so, says H. C. Turner, Jr., president of the Turner Construction Company of New York City.

In a recent staff news letter issued to company personnel, Mr. Turner states that employees of nearly all businesses which operate on a five day week have one day off for every two days of work! Sounds startling, but here are the figures:

Days in year		365
Saturdays and Sundays	104	
Holidays (usual)	8	
Vacation (weekdays)	10	
Non-work days		122
Work days		243

So you see? You don't work so much after all. But perhaps you should work harder. In fact, we've started to rush like mad right now, thinking of all the work we have to get done in such a short time.

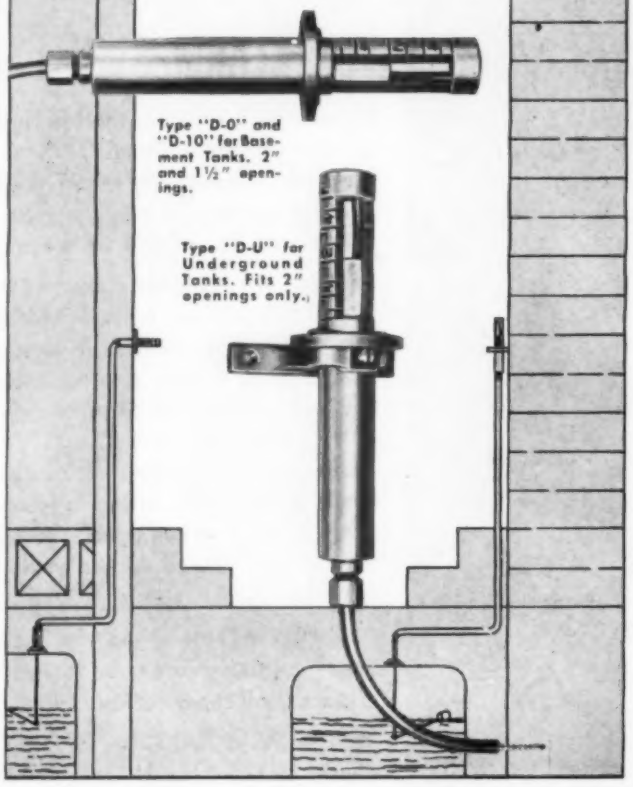
Yielding to Herd Instincts

The question that confronts every thoughtful American today is: Are the three agencies used in the pursuit of satisfaction for the basic human urges — our individual selves, our voluntary group associations, and our governmental agencies—in balance?

No one living in this country in the past half century, knowing anything of the history of mankind's struggle for order and liberty, can escape the conclusion that there is an imbalance between the three.

Too much of life's health, safety, and happiness has been placed in the hands of government. There has been a yielding to herd instincts. There has been a weakening

Sentry AT-A-GLANCE
REMOTE READING
Tank Gauges
For accurate, easy reading of tanks — indoors, outside or underground.



Simple, Inexpensive, Dependable
Easy to Install Gauges for every use

Long wanted — long needed. Sentry now brings you remote reading gauges that accurately indicate correct liquid level at all times. Accuracy not affected by changes or variations of specific gravity of oil. Can be installed with or without additional gauge on tank for dual location reading. No unnecessary fittings, bulbs or levers for oil man to tamper with . . . no need for access to building. Stainless steel and brass extension lines—cast aluminum, weatherproof thermometer type indicator, calibrated in fractions. Easy to read — unconditionally guaranteed. Write for descriptive folder showing complete line.

KRUEGER Sentry GAUGES
GREEN BAY • WISCONSIN

the editor's notebook

The new Type 150 Suspended Unit Heater

Range of Sizes — 60,000, 90,000, 120,000 and 150,000 Btu input cap., for natural, manufactured, butane-air, LP Gas.

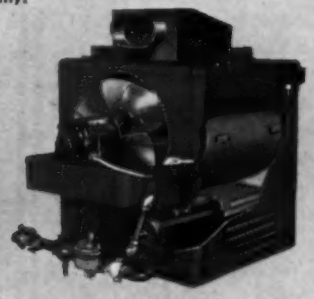
Compact design for extra headroom — only 31" high, including diverter and flue vent on 60,000 and 90,000 Btu sizes. Larger sizes 35½" high. Horizontal flue-outlet on diverter.

All-welded steel heat-exchanger — horizontal tubular design with high crown sheet, no impingement of flame. Completely cleanable from bottom without lowering unit.

Aerated flame burner — cast iron with drilled ports. Single-opening shutter prevents clogging. Burner size increases proportionately with exchanger, for uniform heat distribution.

Quiet, high-delivery blower — discharge may be directed to suit installation, by repositioning the adjustable louvers to blow horizontally or vertically.

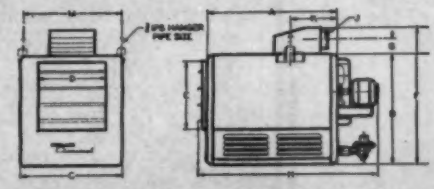
NEW! With unique design features



fuel-thrifty Mueller Climatrol suspended gas-fired unit heater

— to meet a huge demand and bring extra sales to you

Compact, Space-saving Design



Dimensions of Type 150 Unit Heater

UNIT	A	B	C	D	E	F	G	H	J	K	L	M
150-60	21¼	23	23	13½	13½	31	3½	35⅝	6 Dia.	7½	½	22⅛
150-90	29¼	23	23	13½	13½	31	3½	40⅝	6 Dia.	10½	½	22⅛
150-120	29¼	28	27	18½	18½	35¼	4¼	45¼	7 Dia.	7¾*	¼	26⅛
150-150	37¼	28	27	18½	18½	39¼	4¼	50¼	7 Dia.	7¾*	¼	26⅛

* Has four hanging brackets, two on each side.

There is a constant demand for an attractive, compact, efficient, direct-fired gas unit heater — for use in stores, shops, theatres, garages, etc. And the new Mueller Climatrol unit heater meets that demand. Its special features give you an advantage over competition that brings an extra volume of profitable sales to you.

This addition to the Mueller Climatrol gas-fired line is shipped complete, pre-wired, ready for quick, easy installation. It's a new sales-maker for you. Get behind it and you're sure to increase your sales and profits. Write for details. *L. J. Mueller Furnace Co., 2010 W. Oklahoma Avenue, Milwaukee 7, Wis.*

D-96

MUELLER Climatrol

REG. U.S. PAT. OFF.

the editor's notebook

of our independence and an endangering of our liberties.

If the four basic human urges, the urge for survival, the urge for experience, the urge for recognition or prestige and the urge for participation in life's activities, are not satisfied by individual or voluntary action, there are those who will look to government for their satisfaction.

There will always be those who will point out imperfections in persons, in businesses, and in other voluntary enterprises, and say: "Ah! This is a job for government."—N. Bradford Trenham in the Tax Outlook.

Greater Cleveland Market

The potential market for 240,000 blower-filter units and winter air conditioning units in Cuyahoga County, Ohio, is one meriting intensive cultivation, according to the Electrical League of Cleveland.

The first step in selling more consumers on winter air conditioning is to sell them on its benefits.

These are some of the conclusions reached by executives of furnace blower and winter air conditioning equipment manufacturers at an industry meeting sponsored by the Electric Home Bureau of the Cleveland Electric Illuminating Company.

The importance of winter air conditioning to the consumer in the form of advantages, and to the industry in terms of sales revenue, was pointed out by Robert V. Main, supervisor of the bureau.

The market potential of Greater Cleveland was broken down as follows:

76,000 homes with automatic fired gravity warm air furnaces.

140,000 homes with hand fired gravity warm air furnaces.

17,000 existing homes for replacement units each year.

7,000 new homes annually as new prospects.

A basic sales theme, Enjoy Health, Comfort, and Economy, was suggested for the industry by Mr. Main, who displayed samples of proposed signs, posters, and other promotional media incorporating the slogan.

Will T. Clark, residential sales manager of the illuminating company and executive vice president of the league, expressed both his company's and the league's interest in expanding winter air conditioning equipment sales. He described some of the activities which have been used recently to sell benefits to the consumer. These include:

Radio announcements, contacts with architects and builders by the home bureau and contacts with consumers by the lecture bureau of the company.

Cooperative advertising for distributors, direct mail programs for contractors, consumer booklets, equipment displays at public shows, electric display homes, sales training classes for air conditioning contractors, and contacts with the public by the information bureau of the league.

Chance makes even a fool right—now and then.

Letters to the Editors

I have just finished reading Professor S. Konzo's first article in the August issue on heating basementless houses. As I am now in process of designing a heating system for such a house, I should like to have a copy of the design procedure.

OIL or GAS BURNING FURNACES

TAILOR-MADE QUALITY
for the
MASS-HOUSING MARKET

NEW UNITS — NEW DESIGNS
BETTER THAN EVER!

6 SIZES COUNTER-FLO BASEMENT TYPE
65,000 - 85,000 - 100,000 - 135,000 - 165,000
200,000 B.t.u.
3 SIZES UTILITY TYPE HI-BOYS
65,000 - 85,000 - 100,000 B.t.u.
2 SIZES GRAVITY FURNACES
60,000 - 80,000 B.t.u.

Write for New Literature on
COUNTER-FLOW HI-BOYS *for*
FLOOR PANEL HEATING

Built and Priced for
YOUR PROFIT

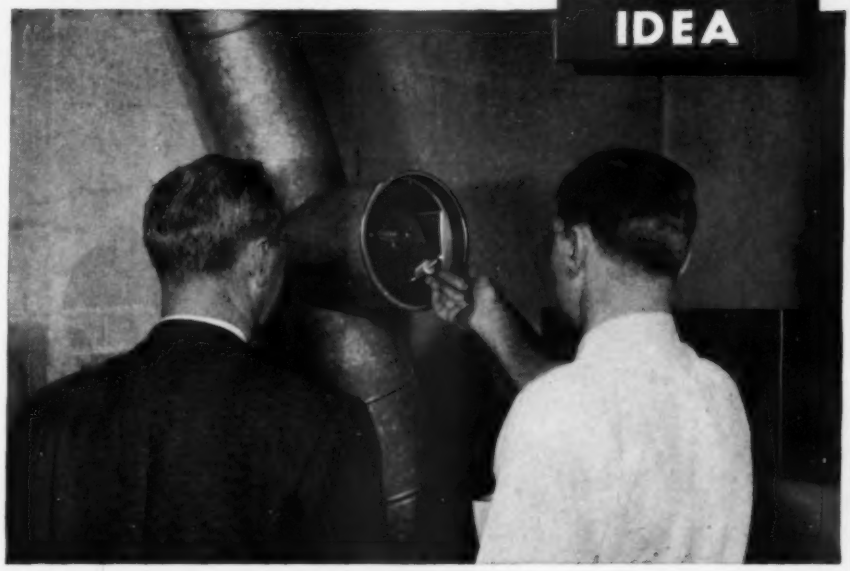
Write

J. V. PATTEN COMPANY

Sycamore, Illinois
Originally Established in 1898
Incorporated in 1928

Heating contractor explains importance of a Field Barometric Draft Control in overall performance of a heating plant.

THIS MONTH'S MERCHANDISING IDEA



LET ACCESSORIES HELP YOU SELL

Sell The Whole

Heating prospects are interested in *total* performance — comfort, convenience, economy, safety. But the overall performance of any heating plant depends upon many component parts and accessories. So, explain, dramatize, SELL these components to your prospects.

Sell The Parts

Important heating accessories, fully and intelligently sold, can give your line a real competitive advantage. A draft control, for example, is a vital part of any heating plant — effecting fuel economy, safety, performance, heating plant life. A heating plant is no better than its draft control. A really fine draft control therefore is a component worth stressing in your sales talk. Do the job right and you'll be leaving with the prospect an important reason for buying *your* line — a competitive sales point.

Use Displays, Literature

Typical of the sales helps you can use daily are the posters, literature and counter displays provided with Field Draft Controls. This material provides a simple, but dramatic sales presentation on a very important heating plant component. Keep such material prominently displayed.

Research Means Sales

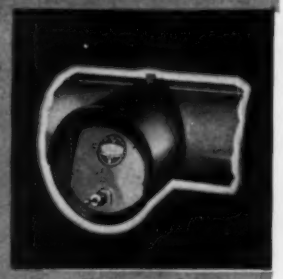
Manufacturer's research for better heating equipment and methods makes an interesting, colorful sales story — makes the price of a heating plant seem reasonable. Yes, the buyer wants *total* performance, but to sell him, sell your heating plant by parts — and stress how each part adds up to finer service, comfort, economy.

Manufacturers' literature prominently displayed helps you sell important component parts.

Manufacturers' research makes an interesting story. Photo taken in Field laboratories.

field means finest in DRAFT CONTROLS . . . . And There's A Field Control For Every Need!

field TYPE M



First and finest for all types of automatic heating equipment.

field TYPE R

First and finest for all types of space heaters and ranges.

field BAROCHEK

First and finest for hand-fired furnaces and boilers, a combination check damper and barometric draft control.

field FUEL SAVING SYSTEM

A newer, finer, more trouble-free damper-motor set with automatic spring return, built-in limit control, "stoke-switch", and booster fan switch.

WRITE for proof of why Field is First and Finest — first choice for the finest in heating equipment.

field CONTROL DIVISION

H. D. CONKEY & CO., MENDOTA, ILL.

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Brick - Tile - Stone

Conco Materials Handling Division
Cranes - Hoists

the editor's notebook

Would it be at all possible for you to send me an advance copy of the next article, so I may apply it to this job? I would appreciate it very much.

NORMAN KRUCHKOW
M. Gottfried, Inc.
Stamford, Conn.

I read . . . the fascinating article entitled Heating Basementless Houses with Warm Air.

. . . this appealed to me and W. G. Senft, and we wonder if it is possible to obtain reprints of this article in quantities between 25 and 200, depending upon their availability and cost.

ROBERT W. LEAR
American Radiator and Standard Sanitary Corp.
Pittsburgh, Penn.

The installment in the August issue was the first of a series of five articles which will be reprinted in booklet form.—ED.

Can you send me some information on heating basementless houses with warm air?

What type of furnace can we purchase for this type of construction?

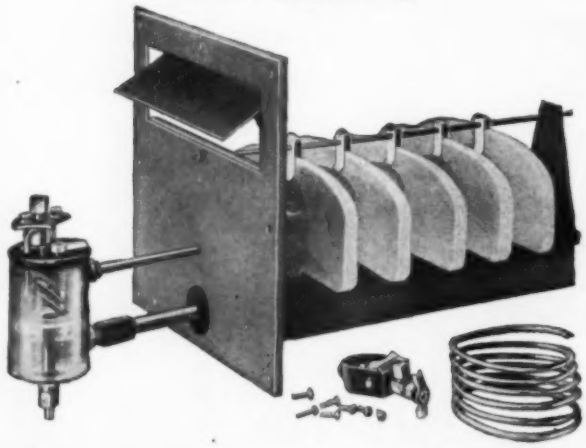
We have several jobs with concrete slabs and would like to get complete information.

ARNOLD PONCETTA
Bell Products
Napa, Calif.

The second installment in the September issue outlines a suggested design procedure for applying a perimeter warm air heating system to basementless houses.

A reprint of articles previously published in AMERICAN ARTISAN, entitled Panel Warm Air Heating, describes several methods of applying warm air heating to basementless construction. Copies are available at $1 each.—ED.

IT'S HERE!
The Small Humidifier You Have Been Waiting For!
THE NEW
MONMOUTH FLOTROL
"310 SERIES"



● MONMOUTH has for many years been the TOP name for dependability in humidifiers. Experts recognize that it is engineered and built on better *operational principles* than most humidifiers. Now Monmouth offers you a *new* model that will certainly meet price competition on your smaller jobs, a companion product to our standard FLO-TROL and MICRO-FEED.

● The "310" is designed especially for modern *smaller* furnaces and air conditioning units, up to 100,000 BTU capacity. Monmouth ceramic diffusion plates (new style). Heavy copper pan. Shipped completely assembled — a 1-package product, nothing to put together, nothing else to buy. Quickly installed from outside the furnace. All you need to do is cut your hole, make water connections, attach access plate (containing combination inspection door and plenum register) to plenum and level the pan with adjusting screw from the front. Register has pivot shut-off valve and equals an 8" x 4" register in free area. The whole front access plate is hinged to pan and fits vertical or slanting plenum.

● Although *lower priced* than previous Monmouth Humidifiers, this "310 Series" model operates on the long famous and time-tested Monmouth principles, has the same control unit, and is in every respect a true Monmouth quality product — just a smaller edition, that's all.

Why not send for a sample "310" Monmouth Flotrol NOW—and see for yourself that it "clicks" perfectly on small furnace installations? The *price* will interest you. Full details on request.

THE CLEVELAND HUMIDIFIER CO.
7802 Wade Park Avenue Cleveland 3, Ohio

MONMOUTH HUMIDIFIERS

the editor's notebook

I have been very much interested in Arthur Robert's many articles in AMERICAN ARTISAN and the series starting in the May issue, Simplified Bookkeeping System, is of special interest.

For some time we have been assisting our dealers and distributors in setting up bookkeeping and accounting methods, but to date we have not settled on any definite bookkeeping system for the smaller dealers.

I am going to be interested in the other installments of the series and if they will be available in book form after publication, I am anxious to get a copy.

BEN O. SCHWARZ
The Waterman-Waterbury Co.
Minneapolis, Minn.

Do you have samples of the forms illustrated in Simplified Bookkeeping System, by Arthur Roberts? If so, please send a set and I will remit by check.

C. R. KING
West Chicago, Ill.

Ledger sheets similar to those illustrated may be purchased in stationery stores and the system may be installed by following the text. The series assumes that the operator has maintained a bookkeeping system and understands the fundamentals of bookkeeping entries.—ED.

Address the editors
6 North Michigan Avenue
Chicago 2, Ill.

ONE MAN AND A LOCKFORMER MAKES MORE
PITTSBURGH LOCKS THAN 16 MEN AND 8 BRAKES

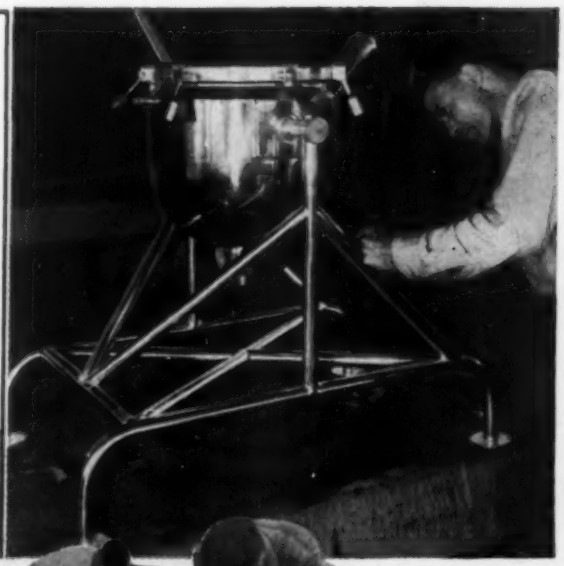
Write for catalog. Address Lockformer, 4615 W. Roosevelt Road, Chicago 50, Illinois

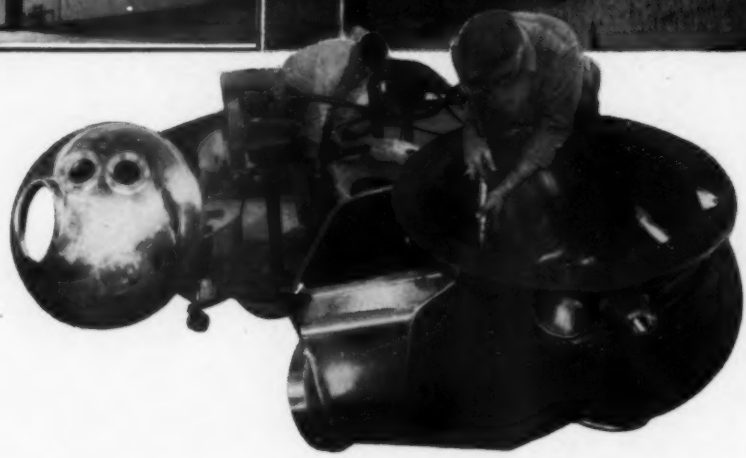
"We built our business on Stainless Steel"

—MODERN METAL FABRICATORS

"As a company, we decided in 1936 that Stainless Steel had a great future because of its sanitary qualities, long life, durability and beauty, and specialized in it. This decision we have never regretted."

—HERBERT STENSTROM, FOUNDER
MODERN METAL FABRICATORS





MR. STENSTROM'S WORDS—affirmed by Partners Lloyd R. Thomas and William I. Kime—tell *why* his company decided to specialize in Stainless Steel fabrication. But the results of this decision speak for themselves.

Modern Metal Fabricators, Vernon, Calif., began operations in 1936 in a plant with 3,000 square feet of floor space. In 1945, the company moved into the new, modern plant shown here—with 10,000 feet of inside floor space. Today, they enjoy an enviable volume of business in fabricating equipment largely made of U·S·S Stainless Steel for the chemical, beverage, citrus, petroleum, dairy and restaurant industries.

This "success story" of Modern Metal Fabricators is typical of many other shops that have grown big from small beginnings by taking advantage of the customer demand for the benefits of Stainless Steel including long life, high corrosion resistance, constant cleanliness and enduring beauty.

No matter how large or how small your shop, you can build your business with Stainless Steel, especially if it's U·S·S Stainless. You'll find this perfected, service-tested Stainless so uniform in finish and in fabricating qualities that it permits the use of the most modern cost-saving techniques.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO · CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

9-1683

UNITED STATES STEEL

QUALITY — THE KEY TO BETTER GAS UNIT BUSINESS

Rybolt Series 58,
Cast Iron Gas-Fired Winter Air Conditioner

The home owner who buys a gas heating unit is making a long time investment. Therefore, he wants *dependable quality* that will insure trouble-free, convenient and economical heating for years to come.

That's why it pays the heating equipment dealer to handle Rybolt cast iron gas-fired furnaces. They are the last word in durability, long life, convenience and economy. They represent the top quality of the Rybolt gas-fired line. Their efficiency and attractive appearance will produce lasting customer satisfaction and give you real prestige in the heating field.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT

The Complete RYBOLT Line also includes QUALITY Coal-Fired and Gas-Fired Units

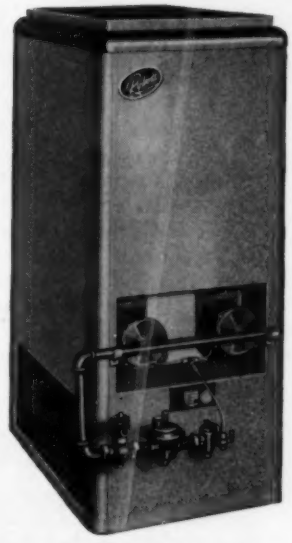
The complete Rybolt line also includes a wide range of gravity furnaces and winter air conditioning units, in cast iron and steel, fired by *coal* and *oil*.

Further illustrating the unusual adaptability and versatility of the Rybolt line it includes a *conversion gas burner*, specifically designed to convert coal-fired furnaces and boilers into modern automatic gas heating systems. Designed for use with natural, mixed, manufactured or liquefied petroleum gas.

Rybolt Series 58 is a completely automatic winter air conditioner thoroughly modern in every detail of advanced heating engineering and design. Three sizes, 70,000 BTU, 105,000 BTU and 140,000 BTU input ratings.

Rybolt Series 53 is a compact gas-fired gravity furnace. Made in three sizes, 60,000 BTU, 90,000 BTU and 120,000 BTU input ratings.

Besides these two series in cast iron the Rybolt gas-fired line also includes a Hi-Boy Model, Series 54, winter air conditioner, unusually compact for basement or first floor installation, which require minimum floor space.



Rybolt Series 53 Gas-Fired
Cast Iron Gravity Furnace

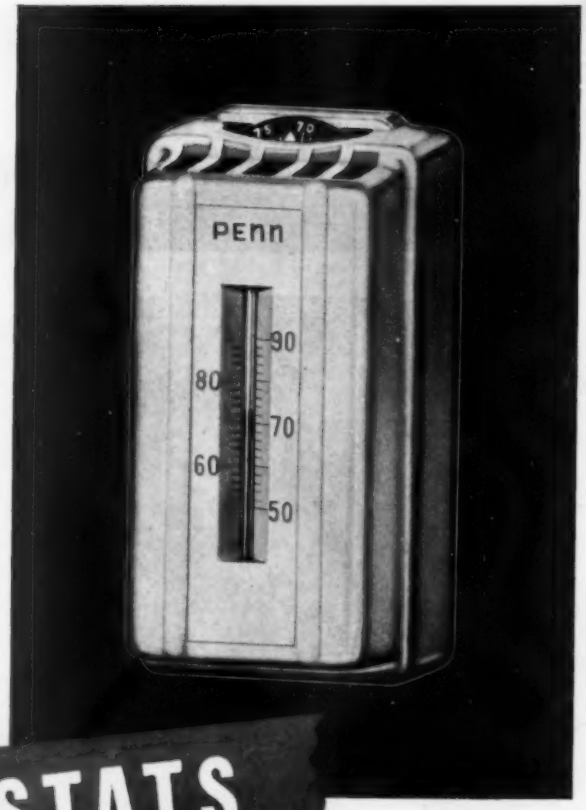
Attractive, illustrated folders giving full details of various Rybolt heating units—fired by coal, gas and oil—are available upon request. Write for them.

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ ASHLAND, OHIO

FOR HEATING COMFORT

THAT'S ON THE LEVEL



PENN THERMOSTATS

with Heat Anticipation

No fooling—*the heat anticipation principle really works.* And, there's 15 years' experience to prove it. With automatic heat of any type Penn thermostats hold temperatures within a half degree of the selected level—and that is comfort that spells *customer satisfaction.*

In the early days of automatic heating, Penn found the way to achieve shorter—and more frequent—burner operations which result in an even flow of warmth. By *anticipating* temperature changes before they occur, Penn thermostats prevent wide swings and the discomfort of "cold 70." Year in and year out the accuracy and dependability of these controls have led more and more dealers to standardize on Penn, *first practical 2-wire heat anticipating thermostat.*

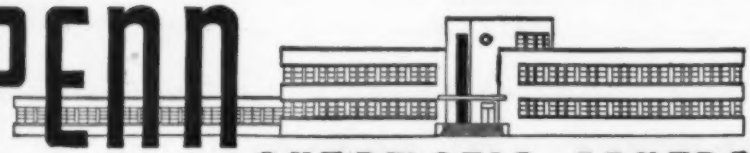
For fuel-saving automatic set-back of temperature, Penn Tem-Clock—an accurate electric timepiece—may be mounted in any room, regardless of thermostat location. Settings are easy to make, and easy to change, without removing cover. Switch to Penn temperature control for all heating applications. **Penn Electric Switch Co., Goshen, Ind.** Export Division: 13 East 40th St., New York 16, U.S.A. In Canada: Penn Controls Ltd., Toronto, Ont.

Here's What Penn Heat Anticipation Does...

- **Holds the temperature within one-half degree of selected level.**
- **Avoids "cold 70"; ends discomfort of "zig zag" heating.**
- **Automatically compensates for outside weather conditions.**
- **Provides more frequent, short burner operations instead of longer runs and standby periods, assuring even flow of warmth for greater comfort and fuel economy.**

It "hugs" the selected level for closer temperature control

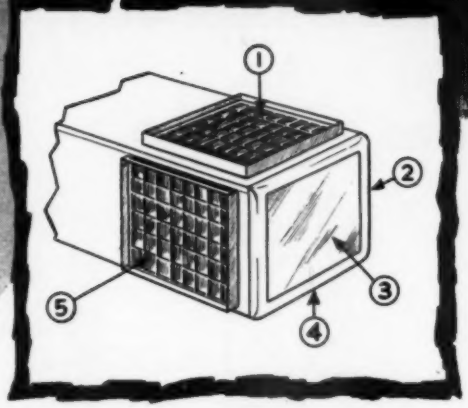
PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

3 Economical, Space-Saving Suspended Furnaces by Gilbarco



for all types of buildings

MODERN, STREAMLINED SUSPENDED OIL-FIRED HEATING UNITS —with these added new features:

5-POSITION AIR INTAKE—for simple, easy duct installation (see diagram).

RIGHT AND LEFT MODELS—available with warm air outlet on either right or left end for further simplification of duct work.

Increase your sales in today's competitive, cost-conscious heating business with this *complete line*. It's the *best* answer to space-saving heating problems . . . tailor-made for homes, stores, garages, service stations and other buildings!

Write today for full information on the GILBARCO Suspended Furnace Line . . . available in 200,000 BTU, 100,000 BTU, and the NEW 150,000 BTU sizes. ALL 3 MODELS are equipped with the famous fuel-saving Gilbarco 'Economy Clutch' Oil Burner . . . that important *extra* sales feature!

Don't miss this great chance for new sales and greater profits!

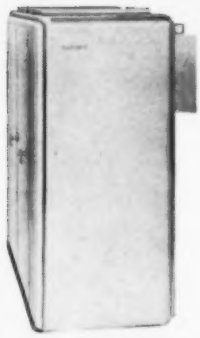
CONVERSION AND REPLACEMENT BURNERS · BOILER-BURNER UNITS · WARM AIR CONDITIONERS · INDUSTRIAL BURNERS

Gilbarco

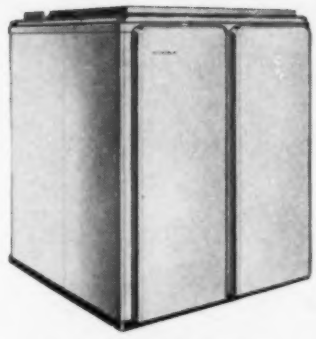
Gilbert & Barker Manufacturing Company
West Springfield, Mass. • Toronto, Canada

Luxaire BUILDS 'EM BOTH!

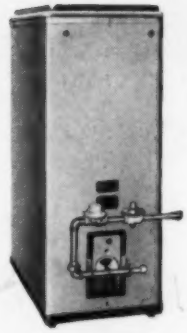
Cast Iron and Steel



SERIES CA
Basement Air Conditioning Unit with Cast Iron Heating Element



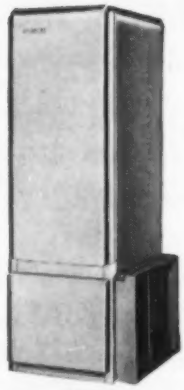
No. CA-140 and CA-200
Basement Air Conditioning Units with Cast Iron Heating Elements



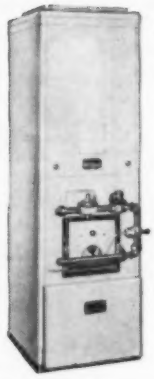
SERIES G
Gravity Furnace with Cast Iron Heating Element

GAS FIRED HEATING UNITS in a COMPLETE range of types and sizes for ALL kinds of home construction

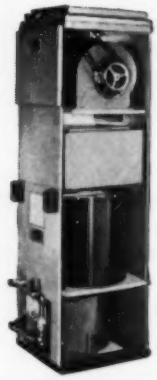
SERIES A
Basement Air Conditioning Unit with steel Heating Element



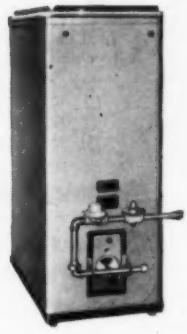
SERIES H
Utility Air Conditioning Unit with Steel Heating Element



No. HE
Utility Air Conditioning Unit with Steel Heating Element



No. HC-E
Interior view Counterflow Air Conditioning Unit with Steel Heating Element



SERIES G
Gravity Furnace with Steel Heating Element

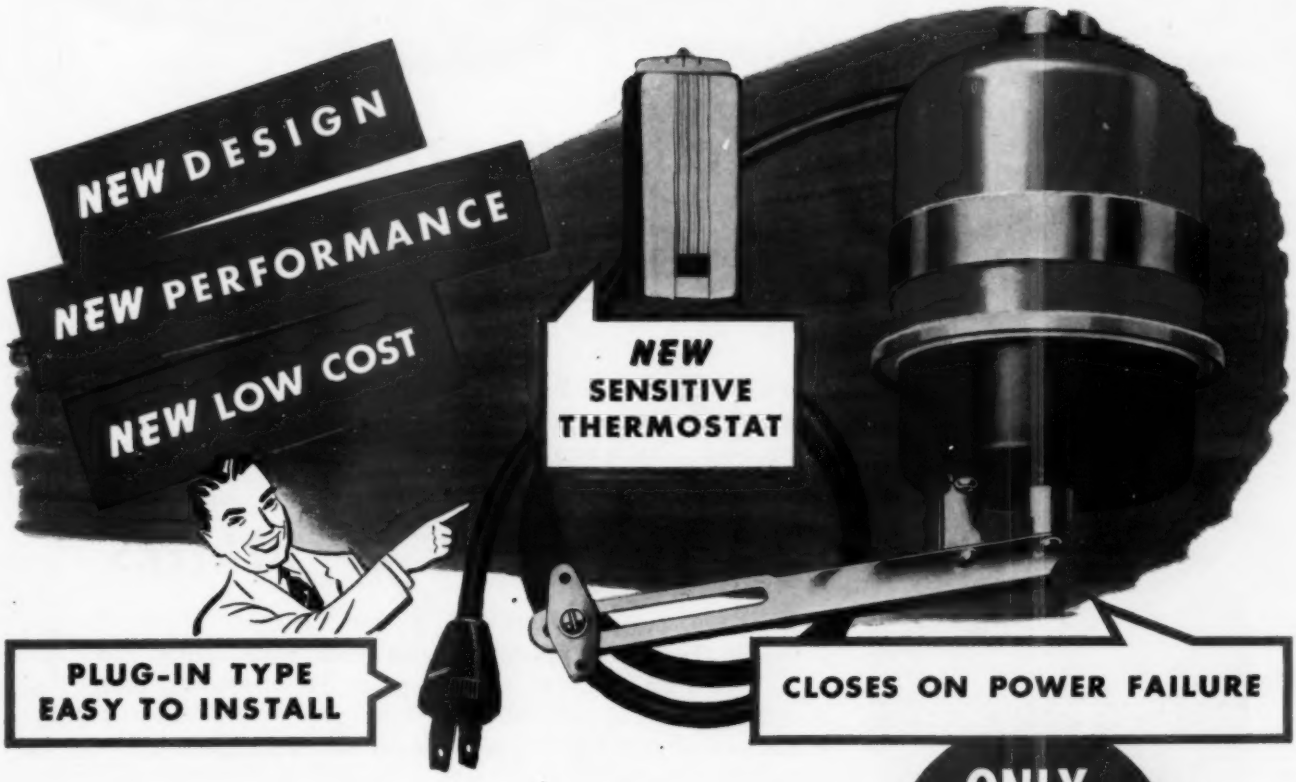
No job too large . . . . .
No job too small . . . . .
For all types of homes—homes with basements . . . homes without basements . . . homes with concrete floor slabs. Luxaire builds both STEEL AND CAST IRON Gas Fired heating and air conditioning units, in a range of types and sizes that cover the complete market demand for efficient economically operating heating units.
All Luxaire Gas Fired heating equipment has many distinctive, outstanding construction, operating, installation and servicing features.
Write for complete catalogs and the name of Your Luxaire jobber.

THE C·A·OLSEN MANUFACTURING COMPANY

Luxaire HEATING & AIR CONDITIONING UNITS
ELYRIA, OHIO

Here's the *NEW* Honeywell Heat Regulator Package...

for Hand Fired Heating Plants!



ONLY $22.90 LIST PRICE

THE NEW Honeywell Heat Regulator package is your answer to the best in low-cost temperature control for hand fired heating plants. It's Honeywell quality throughout, yet it's priced to meet all competition. It's easy to install, being a plug-in type with transformer built in. Amply powered with an efficient impulse pump to provide hydraulic action, this damper regulator is extremely quiet in operation. It is safe against fire hazard, as it returns to closed position when the circuit is broken manually or due to power failure.

The new sensitive thermostat is especially designed to give short regulated operations that save fuel and provide exceptionally accurate temperature control. A complete set of fittings is supplied with each package.

Honeywell Series 40 Limit Controls, such as the LA419 Airstat for warm air systems, the LA409 Aquastat for hot water systems, or the P404 Pressuretrol for steam systems, are designed for use with this new Heat Regulator package. Include limit controls when you order your supply of these new Honeywell Heat Regulator packages. Minneapolis-Honeywell Regulator Company, Minneapolis 8, Minnesota. In Canada: Leaside, Toronto 17, Ontario.

MINNEAPOLIS **Honeywell**

CONTROL SYSTEMS

77 BRANCHES FROM COAST TO COAST WITH SUBSIDIARY COMPANIES IN: TORONTO • LONDON • STOCKHOLM • AMSTERDAM • BRUSSELS • ZURICH • MEXICO CITY

employee heating comfort is measured "by the FOOT."

When it comes to keeping employees comfortable and at top efficiency, one Btu below the knees is worth 100 above the head. That's why it is good business to insist on

DRAVO *Counterflo* HEATERS

Dravo *Counterflo* Heaters banish floor chills; each unit blankets from 4,000 to 20,000 square feet of working area with warmth. The recirculation principle of Dravo *Counterflo* Heaters tends to hold the warm air at the working level, thus reducing roof heat loss and saving fuel dollars. Air throw 100-150 feet; no ducts needed for open areas. Users report first cost 50 to 66% less than wet-type systems. No fuel worries; oil or gas-fired, readily converted from one to other. 80-85% efficiency. Units furnish ventilating air in summer. Immediate deliveries, easy installation. Ask for Bulletin EF-523-5

DRAVO
CORPORATION
DRAVO BUILDING, PITTSBURGH 22, PA.

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs.

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO • ATLANTA • BOSTON

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DRAVO

SAL-MO PRODUCTS

The accumulated experience of more than 63 years engaged in developing and manufacturing Quality Asbestos Products is yours when you use Sal-Mo Asbestos Papers, Millboards, Tapes, Pipe Coverings and many others for domestic and industrial insulation.

Be sure to get the best . . . specify the Sal-Mo Trade Mark.

SALL MOUNTAIN COMPANY

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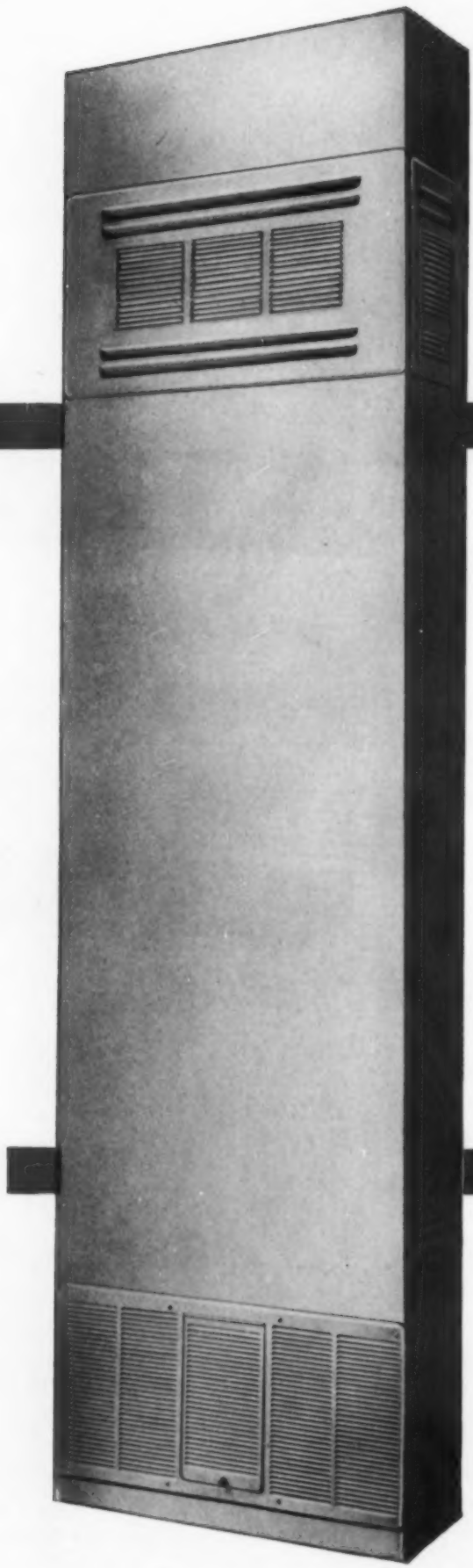

the sensational royal jet-flow means extra profits this heating season

The new easy to sell Royal Jet-Flow gives all the advantages of a forced air unit . . . yet costs only slightly more than a highly competitive floor furnace. Through the use of the jet principle the gas-fired Royal Jet-Flow achieves the amazing velocity of 300 feet per minute without blower or fan. Heats an entire house with a minimum of temperature differential from room to room and ceiling to floor.

The new Jet-Flow is designed to be installed with a minimum of labor and a maximum of profit . . . is now, for the first time, available for general distribution.

Exclusive dealerships are open

in certain areas . . . write today and find out all about the new easy to sell, easy to install Royal Jet-Flow. Don't pass up this extra profits opportunity.

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OVER 50,000 INSTALLED IN HOMES BY AMERICA'S LARGEST BUILDERS

True test of heating equipment is its acceptance and performance. Here are excerpts from letters by builders who have had hundreds of Royal Jet-Flows installed in houses they have built.

FRITZ BURNS
Kaiser Community Homes

6000 Royal Jet-Flows
"The Royal Jet-Flow . . . has become one of our best salesmen. It has given top performance under all conditions. In appearance, design, economy and engineering we feel that the Royal Jet-Flow is the perfect answer for modern homes."

M. J. BROCK
M. J. Brock & Sons, Inc.

210 Royal Jet-Flows
"We have found the Royal Jet-Flow to be one of the major selling points in our subdivisions . . . a remarkable development in home heating . . . giving the small home owner the type of heat heretofore available only in a high-cost home."

J. R. ASHTON
Del E. Webb Construction Co.

825 Royal Jet-Flows
"We investigated every type of heating equipment in the nation before making a decision to use the Royal Jet-Flow . . . It offers such advantages as clear wall space for furniture placement, excellent heat distribution . . . Our experience is proving this superior heating equipment places us at a distinct advantage in today's competitive market."

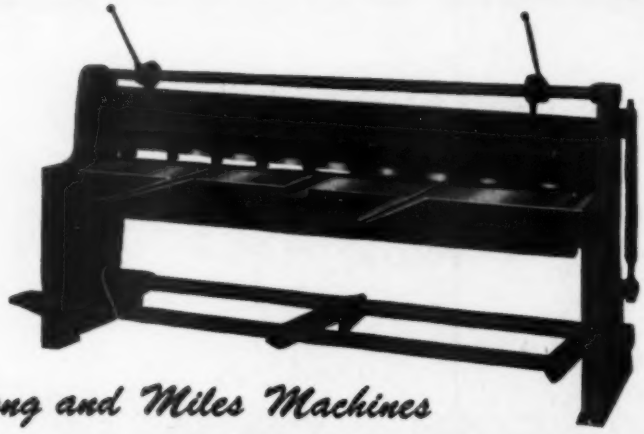
A. QUINCY JONES
Architect

825 Royal Jet-Flows
"We feel the Royal Jet-Flow has proven itself as being everything that was expected or hoped for. Since the project was completed, I have talked to many families living in the houses and they were very enthusiastic about their heating equipment."

ROYAL
HEATERS, INC.

1020 WESTMINSTER AVE.
CUMBERLAND 3-2117
ALHAMBRA, CALIFORNIA

For SHEAR Satisfaction



Install these Wysong and Miles Machines

BETTER ROLLS

FEWER PASSES — LESS EFFORT---Smooth high carbon steel rolls for accurate forming.
Circular grooves for wired edges.
Quickly adjusted for clearance and radius.
100% jig and fixture construction.

AT LOWER PRICES

MACHINE NUMBER	DIAMETER OF ROLLS	LENGTH OF ROLLS	PRICES
230	2"	30"	$ 80.00
236	2"	36"	$ 85.00
242	2"	42"	$ 90.00
836	2½"	36"	$177.00
842	2½"	42"	$210.00
848	3"	48"	$357.00

POWER MODELS—5" Rolls in 48", 60" and 72" lengths.

HANDLED BY LEADING DEALERS
Coast-to-Coast

STURDIER CONSTRUCTION

Greater weight, properly distributed for more efficient shearing. 35% steel castings for greater strength and rigidity. Adjustable gauges, positive holddown and proper leverage for accurate, clean cuts and easy operation.

EXPERTLY BUILT

By skilled workers who know how much the right kind of shearing simplifies succeeding operations. Ways are *hand scraped* and each part is *accurately fitted.*

AMAZINGLY LOW PRICES

MACH. NO.	CAPACITY	WEIGHT	PRICE
1830	18 ga. x 30"	700 pounds	$200.00
1630	16 ga. x 30"	875 pounds	$250.00
1836	18 ga. x 36"	800 pounds	$225.00
1636	16 ga. x 36"	975 pounds	$278.00
1642	16 ga. x 42"	1150 pounds	$330.00
1648	16 ga. x 48"	1250 pounds	$360.00
1652	16 ga. x 52"	1375 pounds	$390.00
1672	16 ga. x 72"	2600 pounds	$630.00
1896	18 ga. x 96"	3600 pounds	$890.00
18-120	18 ga. x 120"	4100 pounds	$1390.00

Prices quoted are F.O.B. Greensboro, N. C.

POWER MODELS—10 ga. in 6, 8, and 10 ft. lengths. 3/16"x96". ¼"x72". 12 ga. in 52", 72" and 96" lengths. 14 ga. x 72".

Also air-powered shears up to 10 ft.

ASK YOUR DEALER OR WRITE FOR CATALOGUE NO. 33

WYSONG and MILES Co.

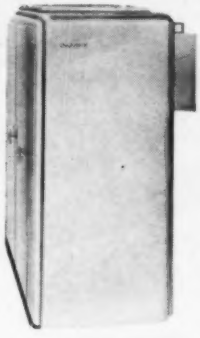
GREENSBORO, NO. CAROLINA

MONCRIEF Simplifies your Buying and Selling of Gas Fired Heating Equipment BECAUSE . . .

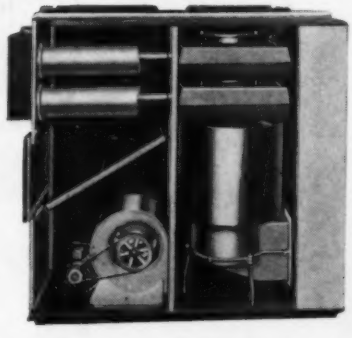
MONCRIEF BUILDS a complete line of BOTH CAST IRON and STEEL UNITS

If the job specifies a Cast Iron Unit—you have it! If the job specifies a Steel Unit—you have it!— because Moncrief builds them both and in a range of sizes that will fit practically any heating job.

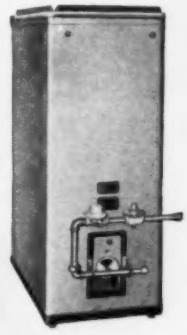
Basement Air Conditioning Units . . . Utility Air Conditioning Units . . . Counterflow Air Conditioning Units . . . Gravity Furnaces . . . for large homes, small homes, homes with basements, homes without basements. From 50,000 B.T.U. to 200,000 B.T.U. input—Moncrief makes them all.



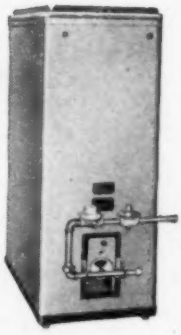
SERIES CL
Air Conditioning Unit
Cast iron heating element.



Side interview view of No. CL-200 unit. Cast Iron heating element
200,000 B.T.U. input

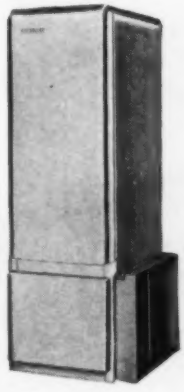


SERIES CW
Gravity Furnace
Cast Iron heating element

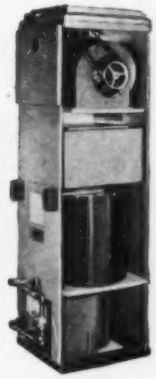


SERIES W
Gravity Furnace
Steel heating element

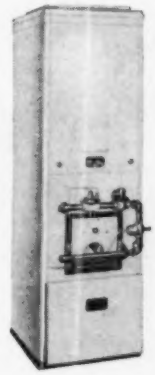
SERIES L
Air Conditioning Unit
Steel heating element



SERIES U
Utility Air Conditioning Unit
Steel heating element



NO. UC-E
Interior View
Counterflow Air Conditioning Unit
Steel heating element



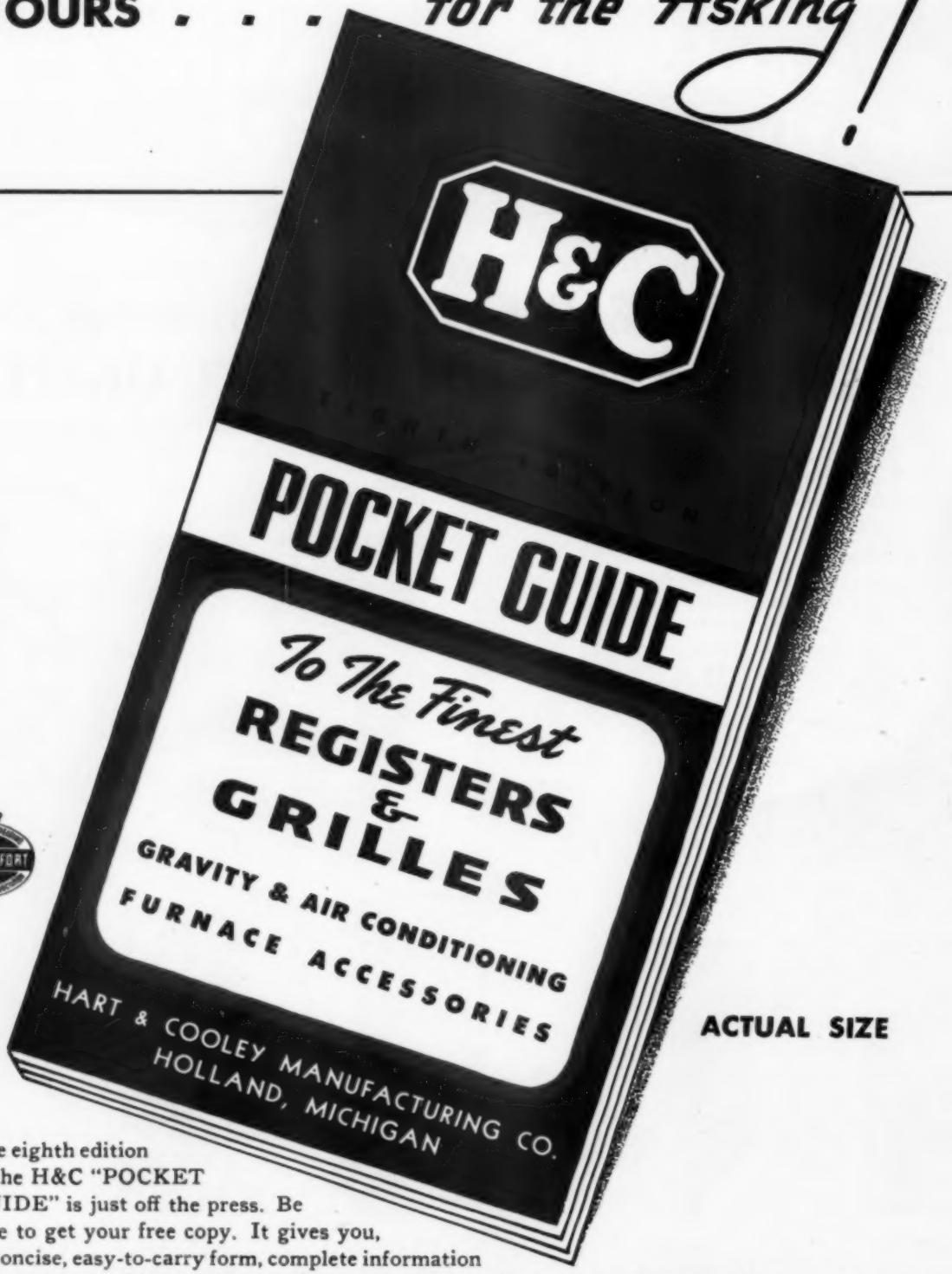
NO. U-E
Utility Air Conditioning Unit
Steel heating element

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF — FURNACE PIPE AND FITTINGS

YOURS . . . *for the Asking!*



MEMBER
INDOOR COMFORT

ACTUAL SIZE

The eighth edition of the H&C "POCKET GUIDE" is just off the press. Be sure to get your free copy. It gives you, in concise, easy-to-carry form, complete information concerning the ideal register for every type of installation; also the essential data on the various items in the H&C Furnace Accessories line. Ask your H&C Jobbers for a copy or write directly to us.

WORLD'S LARGEST MANUFACTURERS OF REGISTERS, GRILLES AND FURNACE ACCESSORIES

H&C

IN CANADA:
HART & COOLEY MANUFACTURING CO., FORT ERIE, N. ONTARIO

The MOR-SUN HEAT EXCHANGER MAKES SENSE!

NATURALLY, we are happy that everyone considers the MOR-SUN casing *the most beautiful furnace casing on the market!* That is an important feature in these days of attractive basement playrooms. However, the insides of the furnace are the most important thing in the long run. Of course, MOR-SUN engineers designed the heat exchanger first, and then designed a functional and beautiful casing to go around it.

You know that heat naturally travels upward. In the MOR-SUN heat exchanger (illustrated herewith), you notice that no attempt has been made to deviate the flow of gases from its natural course! Gases go upward and outward, through a vertical pyromanifold, and through the horizontal pyrovents. You note, also, that some of the gases escape through a tube venting from the top of a combustion area.

All parts of this heater exchanger are die stamped of 12-gauge metal. You see that the stampings include various irregularities, designed to give additional strength. All heating surface is, therefore, *primary heating surface*, giving *maximum efficiency of operation!*

Beauty on the outside and rugged efficiency on the inside! But the MOR-SUN gives even more — dependability — through use of quality control equipment. It gives economy of first cost — due to modern mass production methods. It gives economy of operation proven by laboratory and field tests.

All these the pressed steel MOR-SUN forced warm air furnaces — all these things that assures the home owner of value received!

MOR-SUN FURNACES FOR GAS, OIL, VAPORIZING OIL AND LIQUID PETROLEUM *are similar in appearance and basic principle. However, maximum efficiency for fuel specified is assured by differing features of detail in design and construction.*

MOR-SUN PRESSED STEEL FURNACES

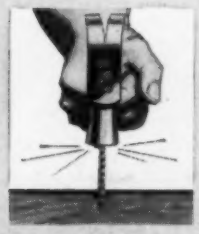
MORRISON

"The Sun Never Sets With MOR-SUN"

STEEL PRODUCTS, INC. BUFFALO 7, N.Y.

Fastening sheet metal to wood ...to masonry?

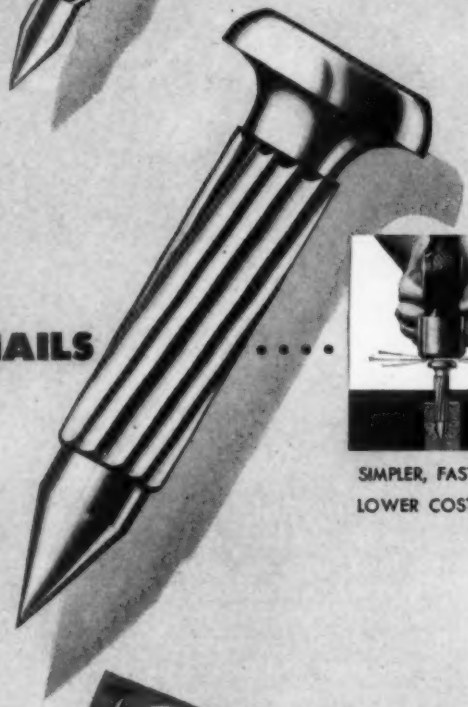
For the better way ...rely on P-K

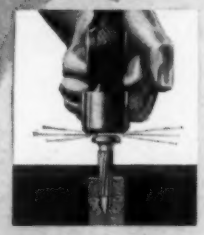


DRIVE LIKE NAILS
HOLD LIKE SCREWS

Hardened
PARKER-KALON SCREWNAILS

Screw strength and nail speed in one fastening — makes sense, doesn't it? Yes, and it makes savings, too, in time and materials. Parker-Kalon Screwnails are *hardened* . . . pierce metal that would bend ordinary nails. And they have over 4 times the holding power! When you drive one, you know it will *stay*. Often that means fewer screwnails needed to do the job.





SIMPLER, FASTER — LOWER COST

Hardened
PARKER-KALON MASONRY NAILS

You simply drive them with a hammer into a drilled hole of the proper size. Saves work as well as time and money. Parker-Kalon Hardened Masonry Nails can be applied more quickly than lead anchors and expansion bolts, hold securely and cost less. In comparatively soft masonry, these simpler, faster fasteners can be driven without drilling holes.

SEND FOR THIS BOOKLET

It tells how and where to use P-K Screwnails and Masonry Nails, gives complete details, including information on punches and masonry drills. Write for your copy. Free samples, too, on request. Parker-Kalon Corporation, 200 Varick St., New York 14, N. Y.

P-K® *The Original*

PARKER-KALON SELF-TAPPING SCREWS

FOR EVERY METAL AND PLASTIC ASSEMBLY

P-K Also Makes *Cold-forged*

OTHER P-K PRODUCTS: Cold-Forged Socket Screws, Wing Nuts, Thumb Screws • Hardened Screwnails and Masonry Nails • Shur-Grip File and Solder Iron Handles • Metal Punches • Damper Regulators and Accessories

Here's the neat-looking job you deliver in less time at lower cost — with Mueller Climatrol Patented Fittings to reduce trunk size and eliminate special fittings.

Comparison of Mueller Patented Takeoff (at left) with typical standard takeoff. The saving in size, metal, and extra fittings is obvious.

Mueller Climatrol patented fittings

cut inventory investment – job time – material costs

Why make your own pipe and fittings, when the complete Mueller Climatrol line offers so many advantages? You can concentrate your man-hours on profitable installations, handle each job faster, more jobs per season. And you don't have to worry about complicated estimates, uncertain costs, and "tricky" balancing!

Complete stocks of every fitting you'll need are available at all times. Absolute uniformity assures quick erection and neat, compact jobs.

CHECK these time- and money-saving advantages of Mueller Climatrol patented fittings:

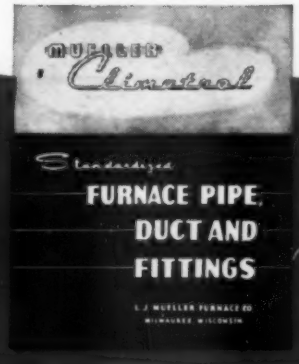
- ✓ Patented take-off reduces trunk-size from 6 to 10 inches at plenum on average installation.
- ✓ Smaller trunk size cuts job time, material costs — makes balancing fast and simple.
- ✓ Eliminate need for increasers, and other extra fittings.
- ✓ "Standardized" costs increase your profits.
- ✓ Conform to simplified practice recommendations of U. S. Bureau of Standards.
- ✓ Also a complete line of duct and fittings for extended plenum systems.

MUELLER Climatrol

REG U.S. PAT OFF

Tear out this coupon and mail today! Ask your jobber!

Just off the press



D-99

L. J. Mueller Furnace Company
2010 W. Oklahoma Avenue, Milwaukee 4, Wisconsin
Rush a copy of your new Furnace Pipe and Fittings Catalog.

Name_____

Company Name_____

Company Address_____

City_____ (.....) State_____

A CHALLENGE

TO MEN WHO THINK ALL FURNACE CEMENTS ARE ALIKE . . .

Use Grant Wilson Asbestos Furnace Cement on your jobs this fall and winter and you'll *continue* to see the difference between this product and ordinary furnace cements.

You'll notice, when you "set" or "re-set" a furnace, that it packs in tight, stays put—does not crack, crumble or roll up. This saves you time, prevents waste and mess—gives you a more satisfied furnace customer. This fine high-temperature refractory cement is fire-proof, acid-proof and odorless.

When the heating season is over, check a few of the jobs on which you have used Grant Wilson Asbestos Furnace Cement. Notice that it shows no deterioration, has formed a tight weld.

It all adds up to greater customer satisfaction, helping build your reputation as an A-1 furnace installer. Get in touch right now with your jobber.

Jobbers! Write now for supply of attractive circular No. 1317-A.

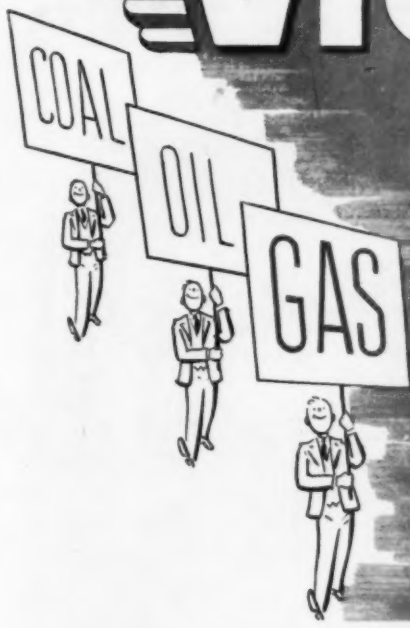
GRANT WILSON, INC.

22nd Floor, Board of Trade Building

LaSalle at Jackson Blvd. Chicago 4, Ill.

DON'T PUT IN ANOTHER FURNACE WITH ORDINARY FURNACE CEMENTS . . . order Grant Wilson Asbestos Furnace Cement from Your Jobber TODAY

VICTOR GAS steps into line

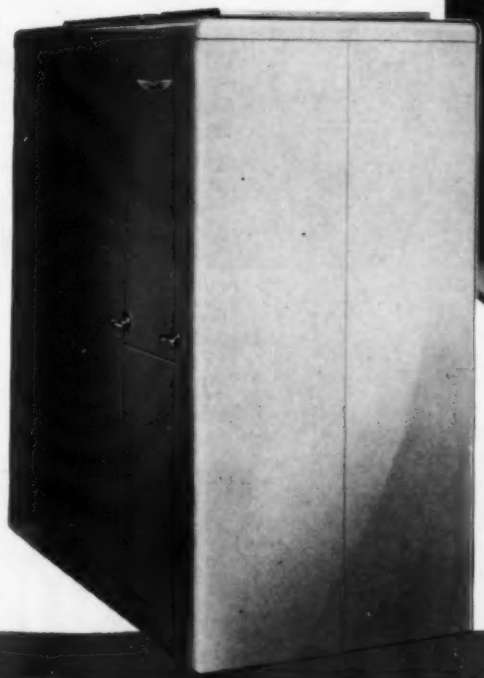


The New VICTOR Series "J" Gas Fired Winter Air Conditioners

- Same high quality construction which has featured VICTOR FURNACES for the past 59 years.
- Heat Exchanger of special corrosion resistant Alloy steel.
- Simple, efficient, single port burner... quiet with all types of gas.
- One-piece steel base pan.
- Fully enclosed burner and controls and many other VICTOR features.

(AGA APPROVED)

Write us... about the **COMPLETE** *Victor Line*



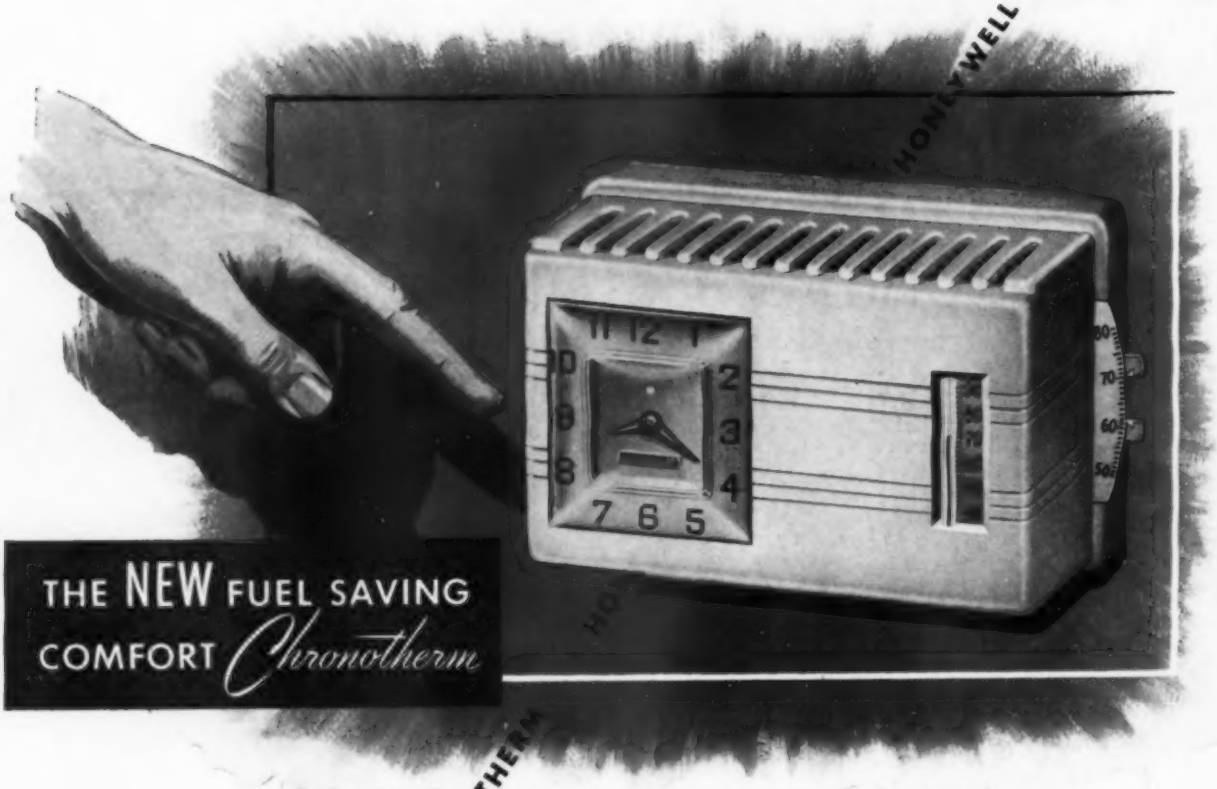
All Low Boy and *High Boy Models* with *Heat Radiating* FINS

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1322-1332 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

The Thermostat That Has Everything



HONEYWELL CHRONOTHERM • • HONEYWELL CHRONOTHERM

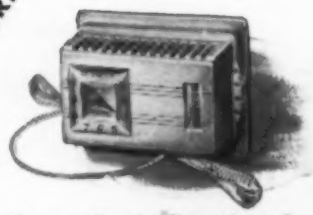
ALL in one package—sensitive, accurate temperature control, with automatic night shut-down for fuel saving, and gradual morning pick-up for twenty-four hour, care-free heating comfort.

These are the advantages you give your customers when you install Chronotherm, Honeywell's completely automatic electric clock thermostat.

What a sales story you have when you talk "Chronotherm." And what a sound method for building your profits and multiplying your list of enthusiastic customers.

So do as dealers everywhere are doing, and push Honeywell's famous Chronotherm. A post card will bring hard-hitting sales and merchandising helps.

Address Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Leaside, Toronto 17, Ontario.



The new Plug-In Chronotherm is designed to replace all manual thermostats. All the advantages of the regular Chronotherm. Anyone can install it in a few minutes.

MINNEAPOLIS
Honeywell
CONTROL SYSTEMS

73 BRANCHES FROM COAST TO COAST WITH SUBSIDIARY COMPANIES IN: TORONTO • LONDON • STOCKHOLM • AMSTERDAM • BRUSSELS • ZURICH • MEXICO CITY

Personalized Heating—

BEYOND THE CITY MAINS

Lewis Gardens, Henrico County, Virginia, is beyond the range of city gas. Yet, the occupants of its 526 suites enjoy the unmatched advantages of gas for *all four* important household services—heating, water heating, cooking and refrigeration. LP-Gas provides these advantages to each apartment on a metered basis, just as in the city.

There is a Bryant *Personalized Heating* System—with Vertical Winter Air Conditioner and Automatic Storage Water Heater—in each suite. Each family has *independent, automatic* control of all heating and water heating in its own home. There is no overheating, no underheating, no waste heat. There is always hot water available, for each family has its own *individual* hot water service.

With *Personalized Heating* as the basis for this *all-gas* service, Lewis Gardens families enjoy a low combined LP-Gas rate for four services that makes its yearly cost comparable to or lower than that of any other fuel or combination of fuels.

In a single or multiple installation . . . on *any gas* . . . Bryant *Personalized Heating* provides operational and space-saving advantages that can help you to bigger and better equipment sales. Get the complete story from the Bryant Distributor in your territory.

"Helped Sell Gas Advantages"

says E. O. N. Williams, President Bottled Gas Corp. of Virginia

"Cleanliness, dependability, underground transmission of fuel . . . these advantages of LP-Gas are clearly demonstrated by Bryant Personalized Heating at Lewis Gardens. This equipment, all automatic, also helped show the way to new economy in LP-Gas operation".

Let the pup be furnace man . . . and water boy, too!

bryant

AUTOMATIC HEATING

BRYANT HEATER DIVISION

Affiliated Gas Equipment, Inc.

Cleveland, Ohio • Tyler, Texas

THE MOST COMPLETE LINE OF GAS HEATING EQUIPMENT IN THE NATION

Do You Think We Exaggerated?

...READ THESE ASTONISHING RECORDS OF OIL SAVINGS

We've been telling you that the Winkler LP* Burner was the sure way to get the cream of new and replacement oil burner business. Here are a few letters from owners† that prove our point. Who couldn't sell Winkler LP's with this kind of evidence?

Saves 40%

"At last I am completely satisfied with oil heat. The way my burner went to pieces, I felt quite badly, but now I can see it was really a lucky day. After you installed a Winkler LP Burner and I saw what it would do, I wouldn't be without it. Why should I, with a saving this year of 40% over last year."

Heats seven room house on 1.87 gallons of oil per day

"From the 17th day of January until the 11th day of May, I actually burned in oil only 216 gallons to heat my house. This figures out to 1.87 gallons per day, and I doubt if such wonderful economy can be matched by any oil burner that I ever heard about. The burner has given perfectly even and satisfactory heat and I have never had the need for a single service call."

Saves $112 or 56%

"Our air conditioning unit with a high pressure oil burner in it was installed in 1940. We used an average of $200 worth of oil each season. This season, we bought only $100 worth of oil with the low pressure Winkler Burner and have over 100 gallons left. This is a saving of approximately $112.

"In addition to the saving on oil, we have better heat, the temperature has been more even, and we have not had smoke or soot or any burnt oil odor such as we had with the old burner."

Cuts oil consumption exactly 50%

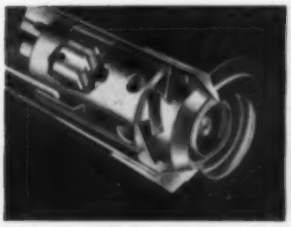
"In checking my oil supply for the winter, I find that the installation of a Winkler Low Pressure Oil Burner has cut my oil consumption exactly 50%. I might also add that the high pressure burner I took out was a new burner, not an old one."

†Name and address furnished on request.

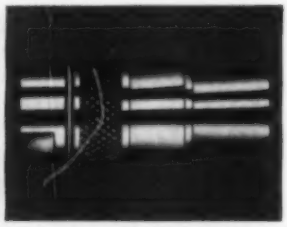
4 REASONS WHY

1. **Fuel Meter** — maintains constant fuel-air ratio.

2. **Fuel Aerator**—intimately premixes oil and air.



3. **Flame Controller** — controls secondary air to correct patterns.



4. **Turbo Nozzle**—large opening is clog-proof.

Don't delay—start making money on Winkler LP* Burners now. Write today for information.

*

LP

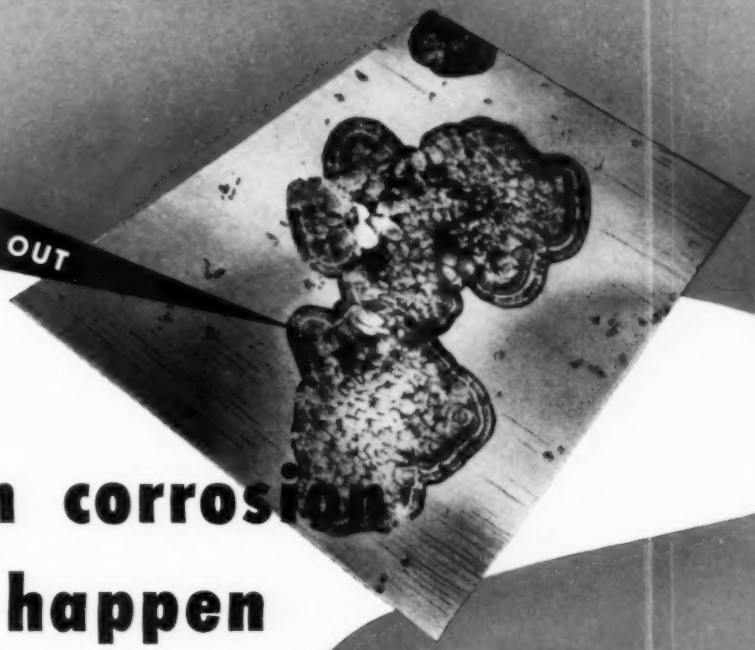
LOW PRESSURE OIL BURNER

WINKLER

Automatic Heating Equipment

U. S. MACHINE CORPORATION, Dept. O-A 10, Lebanon, Indiana

WE WOULD LIKE TO POINT OUT



underfilm corrosion just *Can't* happen with

Weirzin

ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

Paints, enamels, lacquers, varnishes and lithographic inks adhere to Weirzin securely and permanently, because underfilm corrosion cannot occur. The tight, malleable zinc coating, electrolytically applied, becomes an integral part of the sheet or strip . . . remains intact under all conditions of temperature and humidity . . . provides a perfect "tooth" for spray, dip or roller applications.

Extensive fabrication does not weaken this bond—after deep-drawing, forming and punching, the zinc coating remains unruptured and evenly deposited. There are appreciable savings in manufacturing, too, because Weirzin sheets and coils require no pickling or buffing, and very little cleaning . . . there is no need for a primer under paint.

WEIRTON STEEL CO.

WEIRTON STEEL COMPANY

WEIRTON, W. VA., *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION,** *Executive Offices, Pittsburgh, Pennsylvania*

NATIONAL STEEL

NIAGARA

Announces New, Improved Circle Shears

FOR CUTTING CIRCULAR BLANKS, DISCS OR CIRCULAR ARCS OF 20 GAUGE SHEET STEEL IN CIRCLES UP TO 48" DIAMETER

NEW SAFETY - Gears are completely enclosed within housing.

EASY OPERATION - Hobbed steel gears are smooth running. Quick acting center clamp holds the blank. Unmarked sheets can be quickly centered by adjustable swinging gauge. Graduations on bed show approximate diameter of circle.

NEW CUTTING HEAD - Box section design provides strength to maintain cutting and clearance angles for clean accurate work. Cutters and shafts are adjustable. Cutting head can also be used for slitting.

Niagara Circle Shear with rigid electrically welded stand.

Ideal for bench mounting.

and New Rotary Slitting Shears

FOR STRAIGHT LINE CUTTING, SLITTING AND TRIMMING

This is the lowest cost type of machine for slitting long sheets. Patented slitting gauge which is always parallel with the cutters controls the width of strip up to 9". Gauging surface is replaceable at low cost.

WRITE FOR DATA:

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.
DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

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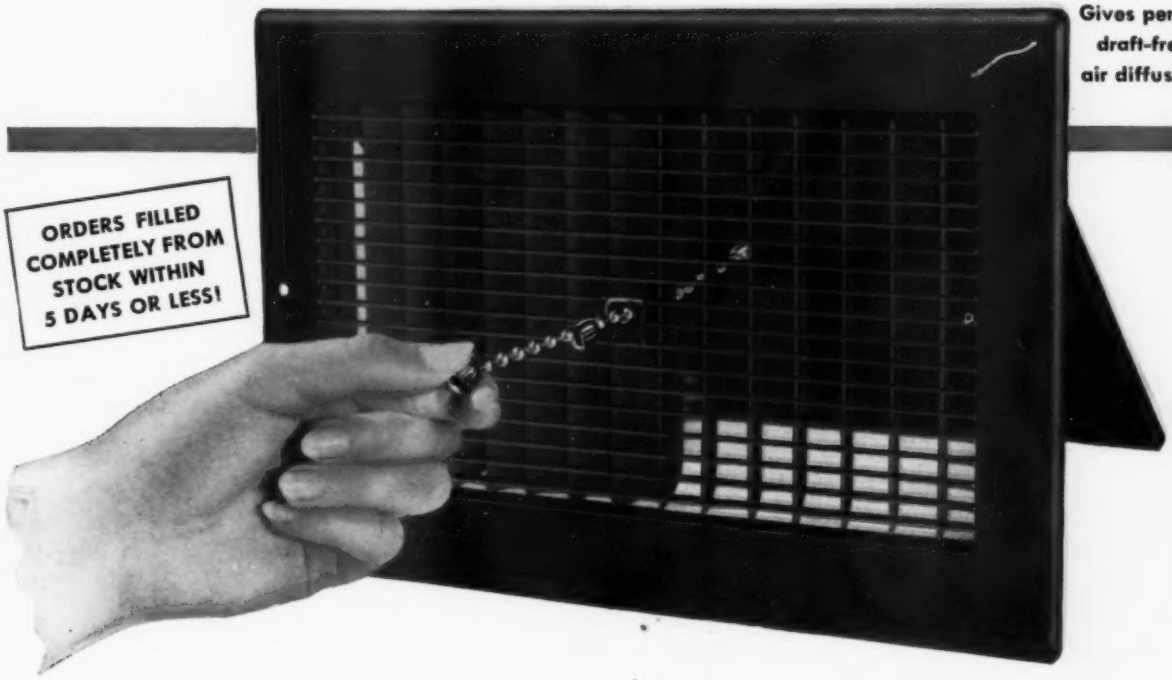
Lima "WORLD'S FINEST REGISTER"

Ends Need for Quadrant Dampers!

Gives perfect draft-free air diffusion

ORDERS FILLED COMPLETELY FROM STOCK WITHIN 5 DAYS OR LESS!



"*Balancing Bell*"* Lets Homeowner Re-Balance His Own Heating System!

No more quadrant dampers! No more service calls to re-balance heating systems! The sensational Lima Register simplifies balancing so that it is now a *one-man, one-time job!*

Equipped with the exclusive "Balancing Bell"* control, this new register lets the homeowner adjust and regulate temperature in every room to suit his requirements. And he never has to call you for help!

The Lima Register is streamlined in appearance, gives perfect draft-free air diffusion. Control valve closes tightly for full heat shut-off. Available in three popular sizes for forced air or gravity systems. And new manufacturing processes enable you to make *competitively priced installations!*

*Patent applied for

THE Lima REGISTER COMPANY
LIMA, OHIO

SEND COUPON NOW FOR DESCRIPTIVE BROCHURE ON ALL LIMA REGISTER SIZES AND STYLES

LIMA REGISTER COMPANY
651 N. Baxter Street, Lima, Ohio

Gentlemen:
Please send descriptive brochure on the complete line of Lima Registers and faces for installation in wall, baseboard and floor.

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

N

W E

"Change course—aye, aye, sir!"

In today's highly competitive appliance market, it's not always possible for a manufacturer to hold to the course of action and product specifications originally plotted.

Very often after he places an order with a supplier, unforeseen developments pop up to necessitate changes in design or quantity. Frequently schedules must be modified on short notice to meet new requirements.

So, as part of developing an organization that places customer satisfaction above all else, Delco Products has acquired the faculty of working under pressure to take care of last minute changes in specifications and schedules.

It's this flexibility—together with modern facilities, sound experience, and a thorough appreciation of all problems confronting a manufacturer—that makes Delco Products first choice of those who need quality appliance motors in volume.

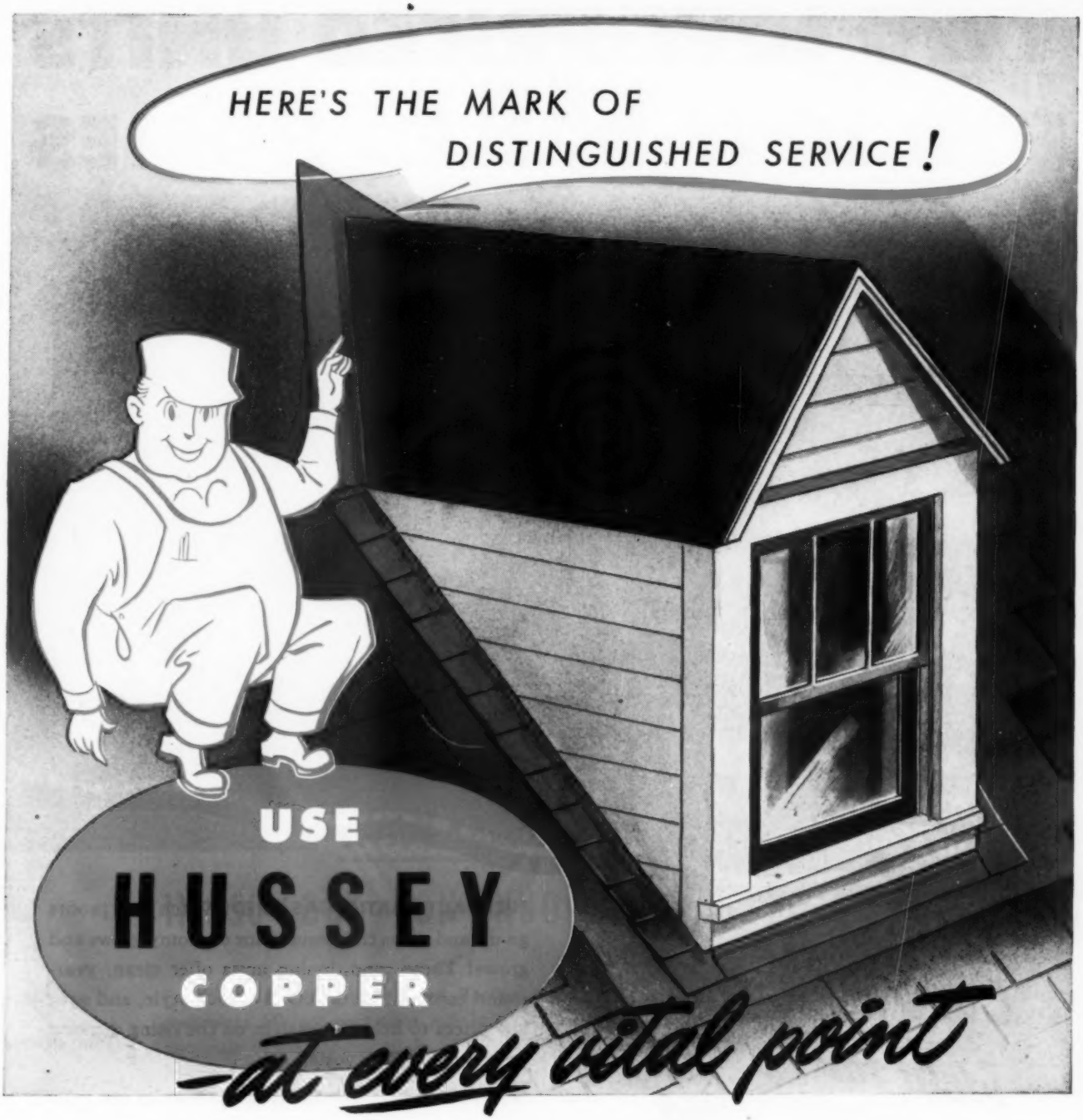
DELCO PRODUCTS DAYTON, OHIO

DELCO MOTORS

DELCO PRODUCTS

Division of General Motors Corporation, Dayton, Ohio

Sales Offices: CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HARTFORD



Hussey Copper flashing, conductor pipe, eave troughs and downspouts are a lifetime promise of distinguished service on any property. Hussey Copper on *your* jobs is a symbol of wise judgment in quality materials and a mark of your distinguished service to the owner. The lifetime durability and trouble-free performance of Hussey Copper at *every* vital point assures a service-life that builds new and repeat business for you. Make sure *your* copper needs are filled with Hussey Copper from the well-stocked Hussey Warehouse near you.

7 convenient warehouses to serve you promptly!

PITTSBURGH, 2850 Second Avenue • CLEVELAND, 5318 St. Clair Avenue • NEW YORK, 140 Sixth Avenue • CHICAGO, 3900 N. Elston Avenue • ST. LOUIS, 1620 Delmar Boulevard • PHILADELPHIA, 1632 Fairmount Avenue • CINCINNATI, 424 Commercial Square

OUR 101ST YEAR ★ 1949

COPPER HUSSEY BRASS

C. G. HUSSEY & COMPANY
(Division of Copper Range Co.)
Rolling Mills and General Offices: PITTSBURGH, PA.

Hussey Warehouses Carry Stocks of Copper and Brass Products for Prompt Delivery

TWO LOW-PRICED UNITS FOR LOW-PRICED HOMES

Built for Easy Sales-Big Profits!

AMERICAN GAS ASSOCIATION · APPROVED · COMPLIES WITH NATIONAL SAFETY REQUIREMENTS

AGA APPROVED

The new KO-Z-AIRE 90's and 115's

Compact! Ideal for Multiple Housing!

FULLY AUTOMATIC! GAS FIRED! Watch your profits go up and up as the demand for economy grows and grows! These conditioning units offer clean, year-round comfort in true KO•Z•AIRE style, and new, low prices to help you cash in on the rising demand for lower building costs.

SHIPPED READY TO INSTALL! All units are fully assembled and wired. Model "90" is rated at 90,000 Btu. input, and model "115" at 115,000. Packaged for efficiency! Competitively priced! Watch for important news about other KO•Z•AIRE conditioning units.

MAIL COUPON NOW FOR FULL FACTS!

Jones & Brown, Inc.
439 Sixth Ave., Pittsburgh 19, Pa.

Please send me the full story on the new, low-priced, fast-selling KO•Z•AIRE units.

Name.....

Address.....

City.....State.....

AA

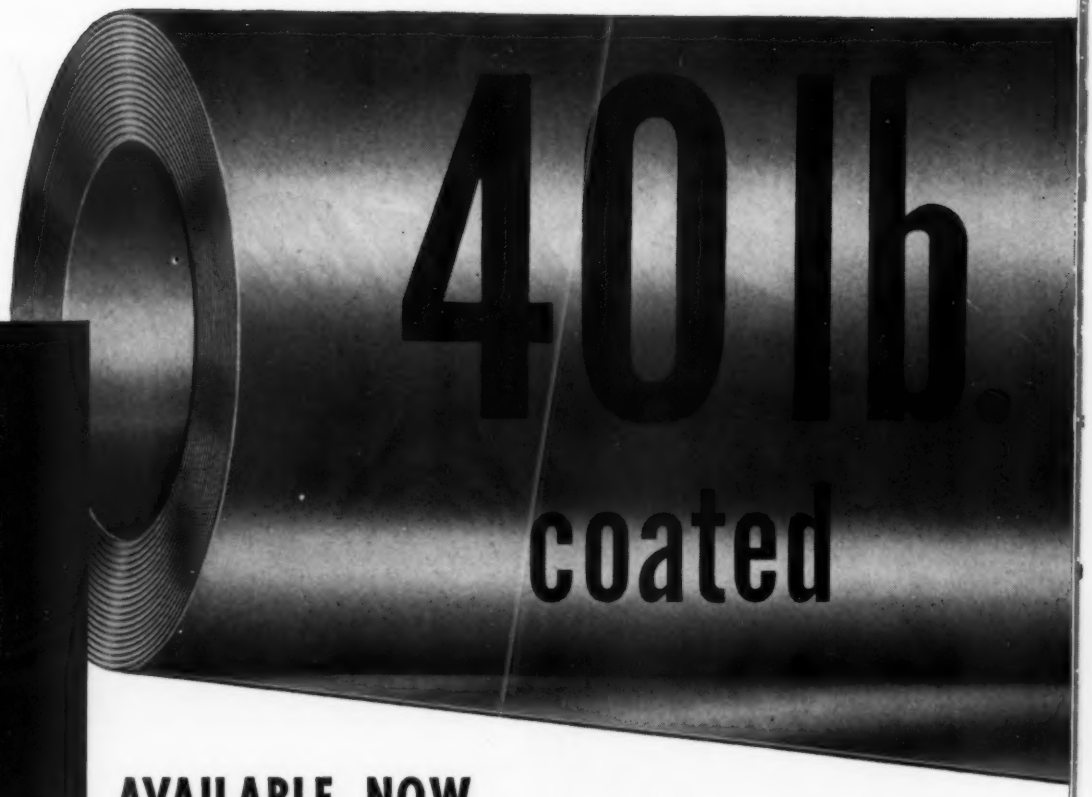
BUILDING PRODUCTS J&B FOR BUILDING PROFITS

KO-Z-AIRE

JONES & BROWN, INC.

439 SIXTH AVENUE · PITTSBURGH 19, PA.

maximum roofing protection with



Follansbee Seamless Terne Roll Roofing

AVAILABLE NOW

IN 50-FOOT CONTINUOUS ROLLS FOR EVERY USE

Follansbee Seamless Terne Roll Roofing, in the convenient 50-foot continuous roll, is once again available in the popular 40 lb. TERNE COATING.

With a base plate of prime copper-bearing steel, 40 lb. Coated Follansbee Seamless Terne Roll Roofing assures maximum roofing protection at a moderate price.

This durable roofing material, available for the first time in many years, offers many advantages—

- **Design harmony with any type of architecture**
- **Strength without comparable weight of other quality metal roofing**
- **Simplicity of application**
- **Durable, weather-resistant construction**
- **Service-proved on residential, industrial, and institutional installations**

Roofing specifications and installation details are available in architect's file form. Send this coupon today for complete information on—

40 LB. COATED

FOLLANSBEE SEAMLESS TERNE ROLL ROOFING

A-10-49

Follansbee Steel Corporation
Pittsburgh 30, Pennsylvania

I'd like specification and installation details on 40 lb. Seamless Terne Roll Roofing.

Name_____

Position_____

Firm_____

Address_____

_____

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS SEAMLESS TERNE ROLL ROOFING

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va., and Toronto, Ohio.

Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N.Y., and Fairfield, Conn.

Anyway you look at it...

THE NEW IMPROVED Janitrol GAS-FIRED UNIT HEATERS have everything

★ NEW SMART APPEARANCE
★ NEW DESIGN FEATURES
★ PROVEN PERFORMANCE
★ LONG LIFE CONSTRUCTION
★ EASY SERVICEABILITY

A. G. A. Approved for all gases including L. P.

Field engineering helped build Janitrol's new, advanced line of Unit Heaters.

Valuable user performance data and field service information were correlated over a three year period as a guide to determine the most practical improvements required for better industrial and commercial heating. Then the actual design and construction improvements in the new Janitrol Unit Heater line became the responsibility of Surface Combustion engineering staff.

This policy of analyzing all practical heating requirements first has resulted in equipment with far greater user acceptance. So, you can count on Janitrol for not only advanced design and efficiency but also for practical, easy maintenance under all kinds of rugged operating conditions.

Because more and more Janitrol Unit Heaters are being installed by retailers, in places of amusement, restaurants, and all kinds of service businesses, special attention was given to smart appearance and compactness.

In most cases Janitrols will be found to be more compact and to provide more headroom than other equipment. Write today for complete specifications and installation data.

A FEW OF JANITROL'S MANY OUTSTANDING FEATURES

★ New Cartridge Type Ribbon Burners: Designed for easy removal and interchangeability for different type gases, special chrome alloy steel for high temperature and corrosion resistance. Separate burners for each heat exchanger make for high efficiency and even heat distribution.

★ Improved, Long-Life Tubular Heat Exchangers: High efficiency of Janitrol's unique design makes possible extreme compactness. Interior suspended alloy steel turbulators accelerate heat transfer. Improved vertical design minimizes dust and dirt collection, contributes to better air flow.

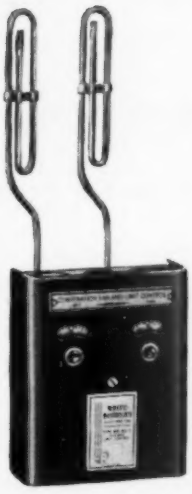
★ Improved, Automatic Pilot: New actuating lever and switch design assures long life, positive operation. While pilot is more positively positioned, assembly can be removed in a few seconds.

★ Combination Fan and Limit Control: Only Janitrol provides dual overheat safeguard as standard equipment, in case of stuck gas valve fan continues to dissipate heat preventing damage to unit or adjacent area.

★ Motor and Fan Assembly: Resilient mountings minimize vibration and noise. Overlapping blade type fans provide maximum air velocity with quiet operation. Direct-a-Flow housing provides uniform airflow over entire unit.

★ Smart, Quality Appearance: Smooth dark grey hammerloid baked enamel finish on steel casing fits unobtrusively in most surroundings. Bottom panel is hinged for opening without removal for inspection of burners and bottom of heat exchangers.

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO



Proved, Dependable, Sturdy

WHITE-RODGERS *Dual*

Hydraulic-Action

FAN AND LIMIT CONTROLS

assure you

QUICKER INSTALLATION and

Better Satisfied Customers

Two controls mounted in a single case, each operating independently, but requiring only a single mounting.

Dials accurately calibrated in degrees Fahrenheit permit exact setting for each installation..

Tremendous power of Hydraulic-Action permits use of more-rugged switch not affected by vibration.

Because the flexible Hydraulic-Action elements can be bent to any angle, and off-level installation does not affect their accuracy, White-Rodgers Fan and Limit Controls can be installed in any position.

Accurate at *any* point in temperature range.

No temperature drift—factory calibration remains throughout life of the control.

High electrical ratings—handles most heavy-duty equipment without motor starters or relays.

WHITE-RODGERS

ELECTRIC CO. ST. LOUIS 6, MO.

Controls

FOR REFRIGERATION · HEATING
AND AIR CONDITIONING

Warm 70°-another FIBERGLAS boost to your C.A.C. Selling!

• C.A.C.—Continuous Air Circulation—is getting a big boost from the Fiberglas campaign currently running. Shown at right is the latest in the series—"Warm 70°—A Brand New Idea In Home Heating." This big full-color page tells—and *sells*—the comfort and fuel-saving story of forced warm air heat . . . the kind of heat you're selling every day.

This year's Fiberglas campaign—using House & Garden, Better Homes & Gardens, Small Homes Guide, plus supporting ads in Architectural Forum—is a campaign that's right behind you in your own selling efforts. Architects who specify, contractors who build, home owners who buy—practically everyone who can help increase your business and your profits has been exposed to it.

Make the most of this national campaign. Your jobber or the manufacturer of the furnace you're selling can furnish you with mats, decals, ad reprints, stuffers—everything you need for effective, profit-building direct mail and other selling programs in your locality. Contact your furnace jobber or manufacturer today, or write Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio.

Now is the time to replace old, clogged DUST-STOP* Filters!

Get a Fall "Furnace Check" letter in the mail to your customers. A clean-up, plus installation of new Dust-Stop Filters mean fuel savings for them . . . and profitable repeat business for you.

DUST STOP* AIR FILTERS

a OWENS-CORNING FIBERGLAS product

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

"YOUR PARTNER WHOSE ACTIONS SPEAK LOUDER THAN WORDS"

**DUST-STOP is the trade-mark of Owens-Corning Fiberglas Corporation for impingement-type air filters made of glass fibers. FIBERGLAS is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with glass fibers.*

70°
70°
70°
"Warm 70°"..a brand new idea in Home Heating!
You can keep your home warm—every room of it—with the thermostat set at only 70°! That's the good news of "Warm 70°"—a simple operational adjustment of the forced air system discovered during the past year. By slowing down the blower, so it operates almost continuously, engineers found they could prevent stratification of heated air in the house—that unmoving layer of hot air on top of the cold air that left many rooms in the house cold even with heat pouring from the furnace. This new adjustment eliminates cold areas near the floor caused by warmer air rising... makes possible, for the first time with any system, floor-to-ceiling comfort at all times, in every room, and with substantial savings in fuel. And the cost of changing existing forced-warm-air systems is nominal, quickly paid for by savings. Forced air also makes possible... cleanliness... something never before possible with gravity warm air heating, with air cleaned by dust-catching filters. Let the women-folks testify to the saving in housework and costly redecorating that has resulted!
If you are buying or building a new home, or if you have warm air in your home—you'll want to get the facts about these most modern advancements in heating. Consult your architect, builder, or warm-air heating contractor.
Owens-Corning Fiberglas Corporation, Toledo 1, Ohio (makers of Dust-Stop* Air Filters, standard equipment on most modern warm-air furnaces since 1930).
DUST-STOP* AIR FILTERS
FIBERGLAS product
GOOD NEWS FOR MILLIONS with modern Warm-Air Systems
DUST-STOP* Air Filters are ideal for the "Warm 70°" system because they offer minimum resistance to the flow of heated air. Made of Fiberglas* fibers coated with a special adhesive, that scientifically clean the air in your
OTHER BENEFITS YOU ENJOY WITH MODERN WARM AIR HEAT
Children are safe from drafts on the floor with "Warm 70°"—stay in warm air healthfully moistened.
Inexpensive replacement of efficient DUST-STOP filters saves fuel, housework, and costly redecorating.
MORE THAN FOUR MILLION PEOPLE WILL BE REACHED WITH THIS CAMPAIGN!

Easiest Package to sell in the Oil Heating Field!

®

...Easiest to install too!

Yes, sir—the easiest way to pick up those "extra profit" dollars right now *is* to push—

Installed in Minutes
Heats up in Seconds
Stands up for Years

PANELOX

STAINLESS STEEL COMBUSTION CHAMBERS

- Every home owner will listen any time to proved fuel savings of 10% to 25% with PANELOX.
- Every housewife will go for the cleaner, quieter home-heating PANELOX assures.
- You'll like the easy sales, low installation cost and extra profits PANELOX brings in.

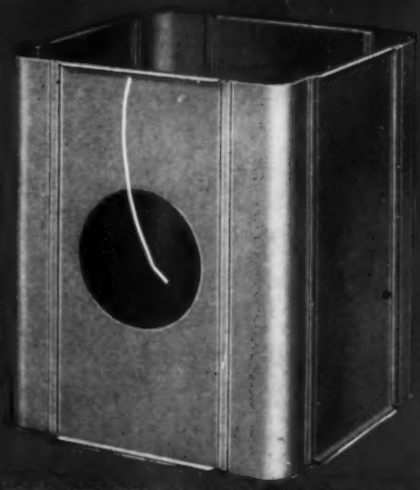
Write, wire or phone today for full details, prices and dealer proposition on PANELOX —the *sensational tested* and *proved* development in stainless steel combustion chambers.

Easy to install. No backfill, no cementing, no tools, no need to remove old chamber.

Four thicknesses of metal at interlocked seams—provides extra strength, rigidity.

Panels made in several widths for easy fitting to a wide range of chamber dimensions.

ROUND. "A" SERIES. New design! New flat port panel for easier sealing of burner gun—reinforced with top and bottom flange. Seams strengthened to prevent warping.



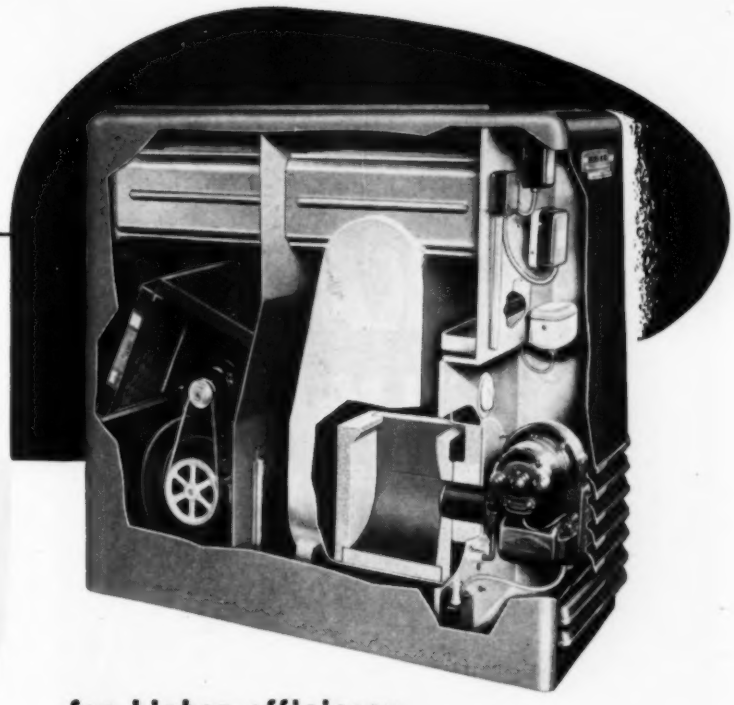
SQUARE. "S" SERIES. Reinforcing flange on flat panels. Rounded corner panels permit perfect flame pattern.

RECTANGULAR. "R" SERIES. Provides more combustion area in narrow fireboxes. Easy to fit any size or shape firebox.

STEFCO STEEL COMPANY

HEATING EQUIPMENT DIVISION • MICHIGAN CITY, INDIANA

unit by HEIL



burner by HEIL

for higher efficiency
easier servicing
greater satisfaction

HEIL units are "ALL HEIL BUILT"

Designed • Fabricated • Sold • Backed—by ONE Reliable Name

There are lots of furnaces and boilers, and there are lots of oil burners. But you can't put just any furnace and burner together and expect the best results. For highest efficiency, for most satisfactory operation, it's obvious that furnace and burner should be made for each other.

In the entire industry, Heil is one of the very few manufacturers building both burner and unit. That means that the Heil Pressure-Atomizing Burner matches the Heil Furnace or the Heil Boiler, that the unit is designed and built as a *whole*, not as a combination of two separate pieces.

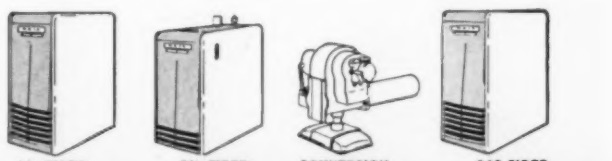
Undivided Responsibility and YOU

Because Heil builds entire units, *you* make more profits. Better design and higher efficiency mean easier sales. Unified construction means less trouble, easier servicing. One source for the entire unit gives you undivided responsibility to simplify your business relationships. Yes, Heil builds the whole unit so that you can build a better business.

Write today and find out more about the Heil Automatic Heating line. You'll see that it's packed with selling points, to help you to more money. You'll find, too, that Heil is known for friendly, honest dealings. It's the franchise you ought to have. Write Heil, Dept. 8109 now!

THE HEIL CO.

GENERAL OFFICES: 3081 W. MONTANA STREET, MILWAUKEE 1, WISCONSIN
Factories: Milwaukee, Wis.—Hillside, N. J.
District Offices: Hillside, Washington, D. C., Atlanta, Milwaukee, Detroit, Chicago, Minneapolis, Kansas City, Dallas, Los Angeles, Seattle.



OIL-FIRED WINTER AIR CONDITIONERS | OIL-FIRED BOILERS | CONVERSION OIL BURNERS | GAS-FIRED WINTER AIR CONDITIONERS

Manufacturers of Quality Automatic Heating Equipment Since 1924

PACKARD SUNLIGHT MOTORS

Built by fractional horsepower motor Specialists

Packard *specializes* exclusively in the manufacture of fractional horsepower motors. Our entire enlarged plant facilities . . . all of our engineering and manufacturing experience . . . are concentrated in this single field. Manufacturers of motor-driven appliances and equipment have long profited from this singleness of purpose. Packard Fractional Horsepower Motors are of outstandingly uniform quality . . . can be delivered in greater quantities in less time. For fast action on your fractional horsepower motor problem, specify Packard motors—engineered and built for lasting satisfaction.

Packard
REG. U.S. PAT. OFF.
TRADE MARK

Packard Electric Division, General Motors Corporation
Warren, Ohio

GM
GENERAL MOTORS

PACKARD MOTORS for

Compressors • Power-driven Bench Tools • Ironers • Milking Machines • Stokers • Milk Separators • Washing Machines • Furnace Blower • Water Pumps • Oil Burners • Ventilators and many other applications

ORS FOR THIRTY-TWO YEARS

for a little extra money
you get a lot more . . . because

TONCAN IRON RESISTS RUST

-all the way through

When you figure the total cost of a sheet metal job, it costs very little more to use Truscon Iron than plain or copper-bearing steel . . . but it means more years of satisfaction and *lower cost in the end* to the building owner.

That's because there is no other sheet metal just like Toncan Iron. An alloy of refined open-hearth iron, it contains *twice as much copper* as copper-bearing steel *—plus* molybdenum to bring out the full effectiveness of the copper. As a result, *it provides the highest rust-resistance of any ferrous material in its price class.*

Because it is an iron alloy, Toncan Iron is easy to fabricate by all modern methods. Cold working—cutting, bending, punching, riveting, soldering, welding—does not reduce its rust-resistance. *This rust-resistance is not confined merely to the surface but extends all the way through the metal.*

More than 40 years of service on all types of structures in all industries have conclusively proved the economy of Toncan Iron. Use it as a profitable business builder by suggesting it for all kinds of sheet metal work. See your Toncan Iron Distributor or write us for further information.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Here's the story

COPPER-BEARING STEEL

molybdenum in proper proportion
Twice as much copper
TONCAN IRON SHEETS, most rust-resistant ferrous sheets in their price class!

Republic

REPUBLIC STEEL

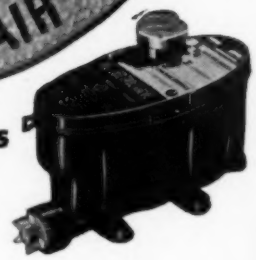
TONCAN COPPER MOLYBDENUM IRON

—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods and other sheet metal applications requiring rust-resistance — and for corrugated metal drainage products.

An Established SERVICE TO OIL BURNING APPLIANCE DEALERS

OIL-CONTROL SERVICE STATIONS NATION WIDE

AUTHORIZED Oil Controls SERVICE AND REPAIR
AUTOMATIC PRODUCTS COMPANY MILWAUKEE, WISCONSIN



- **FACTORY-TRAINED STAFFS**
- **COMPLETELY FACTORY-EQUIPPED**
- **FULLY STOCKED WITH CONTROLS AND PARTS**
- **TRAINED FOR FAST, DEPENDABLE, ACCURATE SERVICE ON ALL A-P CONTROLS**

Let these factory-trained technicians take over your repairing, recalibrating, adjusting of all the A-P controls used on the oil burning appliances you sell: vaporizing oil burning space heaters, water heaters, floor furnaces, furnaces, ranges and others.

A great contribution to oil heating satisfaction, these A-P established Authorized Service Stations will speed up your service, help you cut down maintenance costs, provide you with an extra sales advantage on all appliances equipped with A-P Dependable Oil Controls. For prompt "factory-trained" service, get in touch with the A-P Service Station nearest you.

These Stations are established and staffed for your benefit. Use them to help you to assured satisfaction in oil heating.

CALIFORNIA
Geo. T. Hall Co.
5625 W. Washington Blvd.
Los Angeles

COLORADO
Instrument Service Co.
833 Champa Street, Denver

CONNECTICUT
Bell Pump Service Co.
44 New Britain Ave., Hartford 6
Bell Pump Service Co.
750 Congress Ave., New Haven

ILLINOIS
OK Oil Burner Supply Co.
446-448 N. Western Ave., Chicago
Oil Heat Parts Service
608 Lafayette Ave., Rockford

INDIANA
Gary Steel Products Co.
1044 Washington Street, Gary
Lee's Heating Service
3739 Sutherland Ave., Indianapolis

IOWA
Iowa Electric Motor Service
725 Tuttle Street, Des Moines

MARYLAND
R. E. Michel Company
1011-17 Greenmount Ave.
Baltimore

MASSACHUSETTS
Bell Pump Service Co.
888 Main Street, Springfield

MICHIGAN
Krieg Brothers
7824 Charlevoix Ave., Detroit

MINNESOTA
Circulating Oil Heater Service
1101 S. 5th Street, Minneapolis
Circulating Oil Heater Service
8th & Broadway, St. Paul

MISSOURI
A. G. Brauer Supply Co.
2100 Washington Blvd., St. Louis

NEW JERSEY
Certified Fuel Unit Service
600 Spring Street, Elizabeth
Universal Engineering Co.
344 Wagaraw Road, Hawthorne

NEW YORK
Certified Fuel Unit Service
1018 Central Ave., Albany
Frontier Oil Refining Corp.
367 Northampton Street, Buffalo
Rochester Oil Burner Pump & Control Service, 204 Clinton Ave., North, Rochester 4

NORTH CAROLINA
Alley & Rader Services
1006 Webb Ave., Burlington

OHIO
Ace Heating Service
1218-20 Race Street, Cincinnati
Ohio Pump Service Co.
7904 Lorain Ave., Cleveland

OREGON
Industrial Control Co.
1412 East Burnside, Portland

PENNSYLVANIA
Carroll & Martindale
727 Myrtle Street, Erie
Certified Fuel Unit Service
3412 W. Allegheny Street
Philadelphia

RHODE ISLAND
Rhode Island Fuel Pump Service
847 N. Main Street, Providence

VIRGINIA
R. E. Michel Company
514 S. Pine Street, Richmond

WASHINGTON
Seattle Pump Service Co.
817 Republican, Seattle
Spokane Washer Co.
203 West Main Street, Spokane

WISCONSIN
Automatic Products Co.
2200 N. 31st St., Milwaukee

CANADA
Michaud & Fils Limited
4146 St. Denis
Montreal 14, Quebec

AUTOMATIC PRODUCTS COMPANY

2452 NORTH THIRTY-SECOND STREET • MILWAUKEE 10, WISCONSIN

DEPENDABLE *Oil Controls*

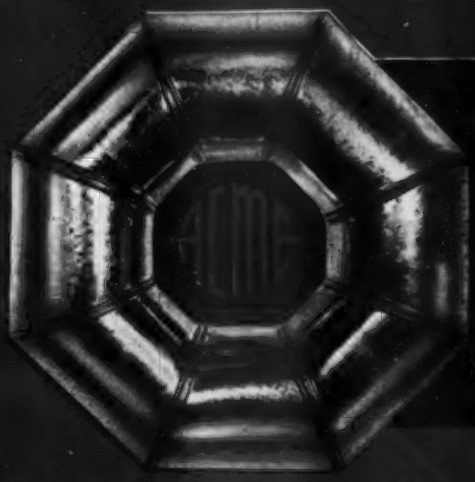
STANDARD EQUIPMENT ON ALL LEADING OIL BURNING APPLIANCES

ACME

FURNACE PIPE, DUCT and FITTINGS

memo

Write today for Acme's new catalog and name of the nearest jobber.



CATALOG NO. 49

FURNACE PIPE AND GRAVITY FITTINGS . . Pages 2 to 9

DUCT AND FORCED AIR FITTINGS . . Pages 10 to 15

STOVE PIPE, ELBOWS AND FITTINGS . . Pages 16 to 17

SPECIALTIES AND GENERAL INFORMATION . . Pages 18 to 24

ACME MANUFACTURING CO.

Sheet Metal Fabricators

PHILADELPHIA 36, PENNSYLVANIA

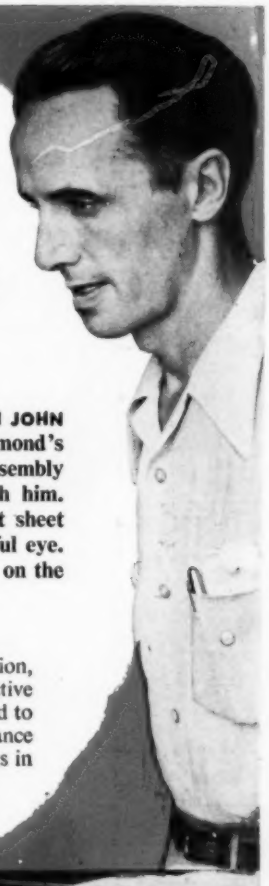
A job well done is a job done with...

Wheeling's Modern Equipment Means Uniform Quality

WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

ATLANTA BOSTON BUFFALO CHICAGO CLEVELAND COLUMBUS DETROIT KANSAS CITY
LOUISVILLE MINNEAPOLIS NEW ORLEANS NEW YORK PHILADELPHIA RICHMOND ST. LOUIS

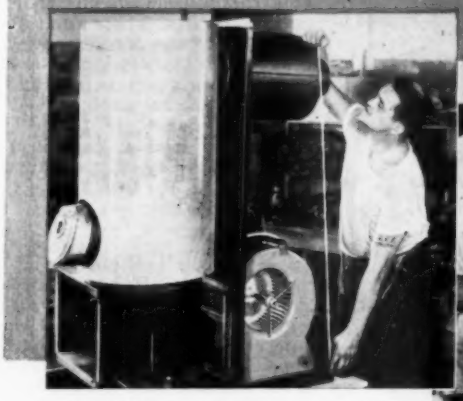
Putting the Heat on a Furnace!



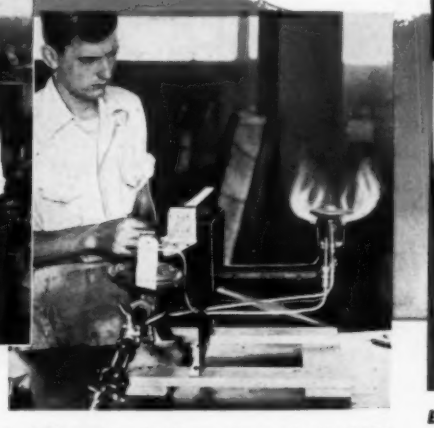
MAKING IT HOT FOR FURNACES IS AN OLD STORY WITH JOHN VEN DOUERN, Chief Assembly Line Inspector for Richmond's New Castle, Delaware, plant. During his 15 years on assembly lines, quality control has become second nature with him. Every step in furnace production, from initial die-cut sheet metal fabrication to final assembly, is under his watchful eye. Shown with him are some of the men who put quality on the line at New Castle.

***Peter Loch** has been working with sheet metal for 31 years. Pete checks the work of the sheet metal department against specifications. His years of experience have made his checks exacting. Not until he is satisfied that original specifications have been met—does the unit go on to the assembly line.*

As a result of close personal inspection and supervision, *all* Richmond heating units are guaranteed against defective workmanship or material. Also, *all* units are guaranteed to develop their published ratings—gas units in accordance with the American Gas Association Code—the oil units in conformance with Commercial Standard CS104-46.



***Robert Kleiman,** a line inspector, supervises the assembly of the various parts of the heating unit. He makes sure each element is in its proper position and thoroughly secured in place. For years Kleiman has been on the line—checking his assemblies—and passing them on for enamel jackets.*



***Paul Simon** is testing the gas burner for the AS23. Each burner, oil or gas, is completely tested and thoroughly checked. They are checked for fuel leaks, electrical connections and control operation. Not until this careful test is completed and passed is a burner released for shipment with the furnace.*

***Elwood McCabe,** who adds 6 years as aviation metalsmith for the Navy to his years on the Richmond line, is a final assembly inspector. Completely assembled furnaces, with their gleaming enamel jackets, are critically examined by McCabe. He makes sure every detail is perfect and that the furnace is ready for shipment.*

RICHMOND
PLUMBING & HEATING

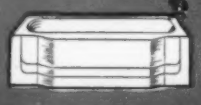
RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.

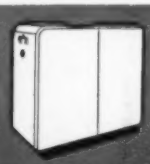
SEE OUR CATALOG IN SWEET'S

Vitreous China

Gas Boilers



Enameled Cast Iron Ware



Winter Air Conditioners
Gas—Cast iron or steel
Oil—Steel

See your plumber or mail coupon today!

Richmond Radiator Company AA-10
19 East 47th Street,
New York 17, N. Y.

Please send me the latest literature and information on the Richmond line of heating equipment. No obligations, of course.

Name.....

Company.....

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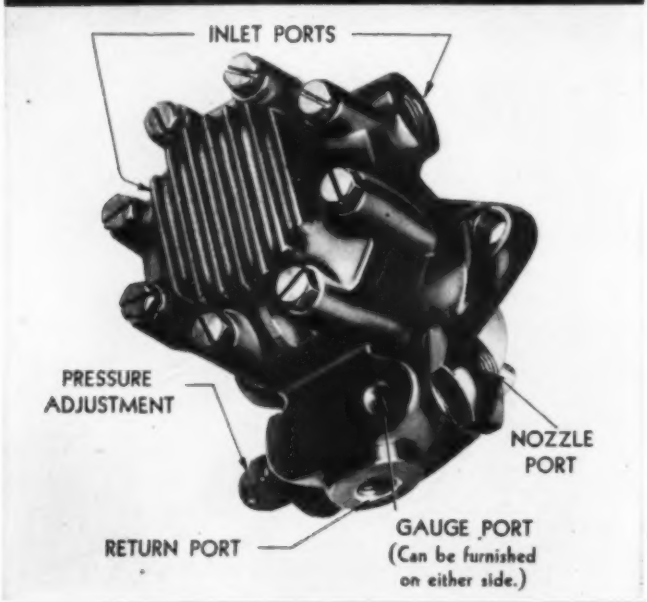
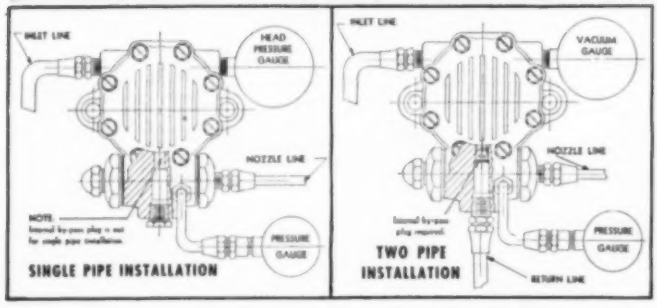
another SUNDSTRAND FUEL UNIT FEATURE





Convenient Porting Simplifies Installation and Service....

Here's another important feature of Sundstrand Fuel Units. With the two inlet ports it is possible to check for vacuum on a two pipe system or head pressure on a single pipe system without breaking the inlet line. In addition, it is easier to install or pipe the unit with a minimum of piping.

Check all the features of Sundstrand Fuel Units and install them with confidence.

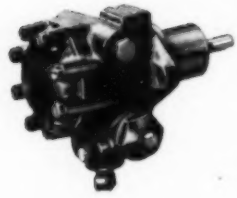
FREE ADITIONAL DATA —This booklet will give you more complete details on the Sundstrand line. Use it for a handy reference on those unusual jobs that come up now and then. Write for your copy today. Ask for Bulletin No. A-46. NOTE: Sundstrand Fuel Units are being manufactured in Canada by John Inglis, Ltd., 14 Strachen Avenue, Toronto, Canada.

Fuel Units for All Types of Burners

S1-B — Most popular unit for domestic oil burners. Entire capacity of pumping members is 21 GPH. Maximum nozzle capacity of either 4½ or 6 GPH depending upon strainer rating.

S1-H — Has maximum nozzle and strainer capacity of 13 GPH. Entire capacity of pumping members is 27 GPH.

S1-J—Used on oil burners with main line filtering means of capacity equal to or greater than maximum capacity of burner. Maximum nozzle capacity is 20 GPH. Entire capacity of pumping members is 35 GPH.



S-2 — Two-stage pump with strainer has maximum nozzle capacity of 6 GPH. Entire capacity of pumping members is 18 GPH. Used on "two-pipe" system for either outside or inside installations where vacuum requirements are not more than 15 inches.

Model R—Two stage unit suitable for vacuum requirements up to 25 inches. These units are self-purging and recommended for two line installations where unusually long suction lines and high lifts are required. Available in either 6 or 10 GPH nozzle and strainer capacities. Entire capacity of pumping members is 18 and 21 GPH respectively.

L1 — For small oil burners and water heaters. Has nozzle capacity of 2 GPH, has 25 watt power consumption, and when operated at 1725 RPM provides pumping capacity of 6 GPH. Recommended for gravity feed installations only.

1-OB Series — Pumps without strainer and regulating valve. Made in 3 sizes of 21, 27 and 35 GPH.

SOLENOID OPERATED UNITS FOR FAST CUT-OFF

They provide instantaneous cut-off on high resistance type furnaces and eliminate an unbalanced air-oil condition upon shut-down. Prevents "flutter" and "puff-back" in combustion area and produces absolute clean burning.

"Nationwide Distribution and Service Facilities"

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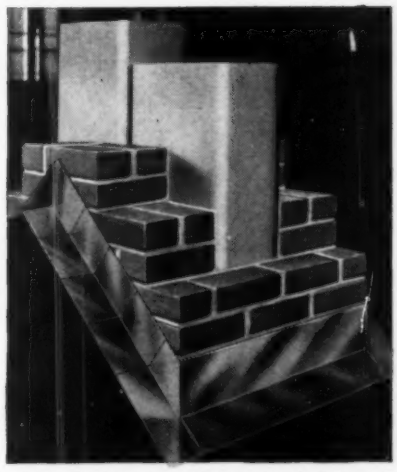
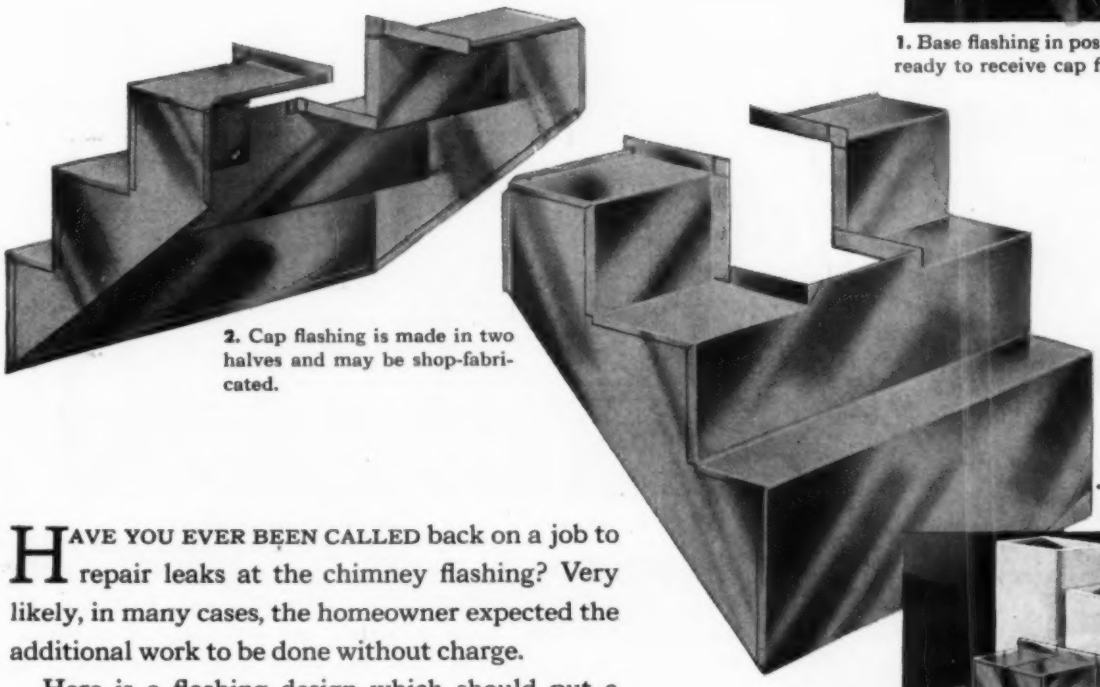
FUEL UNITS • HYDRAULIC PUMPS • TRANSMISSIONS • FLUID MOTORS • VALVES and CONTROLS

How to Flash a Chimney *so it can't leak...*



1. Base flashing in position with brickwork ready to receive cap flashing.



2. Cap flashing is made in two halves and may be shop-fabricated.

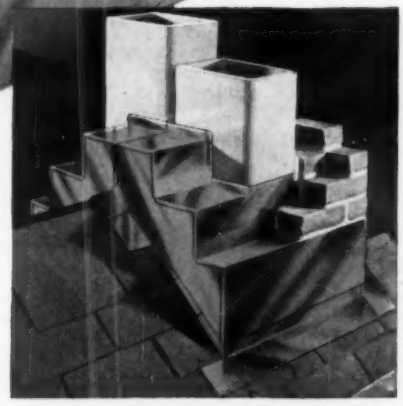
HAVE YOU EVER BEEN CALLED back on a job to repair leaks at the chimney flashing? Very likely, in many cases, the homeowner expected the additional work to be done without charge.

Here is a flashing design which should put a stop to those unprofitable "call backs." It's a job you will be proud of, and few owners will question the wisdom of paying a little more for this assurance against future trouble and expense.

A full-scale model displayed at The American Brass Company's Exhibit, National Association of Home Builders Convention, Chicago, attracted much attention, and received very favorable comments from architects, builders, sheet metal contractors and homeowners.

As will be seen, the cap flashing, made in halves, may be fabricated in the shop and quickly joined on the chimney by a simple lock seam.

Detailed drawings, for flashing both center chimneys and outside chimneys, have been prepared and will be sent free on request.



3. Cap flashing halves joined in position and showing continuation of brickwork.

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Subsidiary of Anaconda Copper Mining Company

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Auer HEAT-RITE

-a Gravity Register of TOP Quality and Appearance

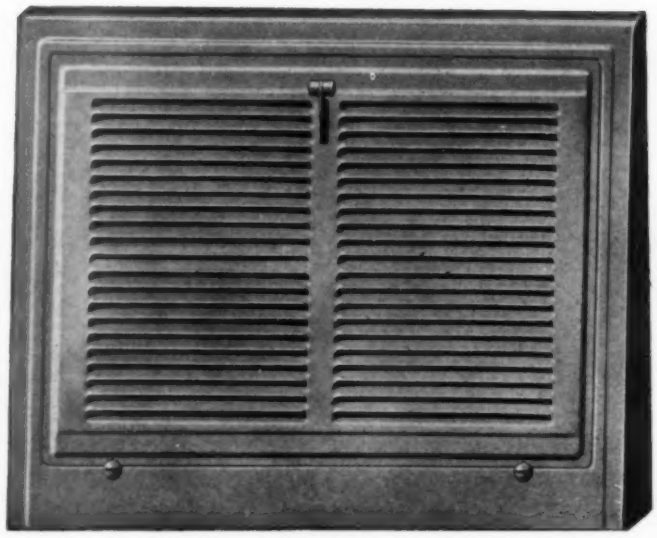

Fig. H-800

Heat-Rite brings to gravity register design a high standard of excellence—fine workmanship in forming and finishing, admirable appearance, great durability and efficiency in operation. It has closely spaced fins, with the same streamlined beauty as modern *air conditioning* models. Yet construction is strong and rugged at every point. Heat-Rite makes an easy, tight-fitting, neat installation. Abundant open area, removable face, and adjustable fins for desired up-or-down deflection.

A unique patented spring tension adjustment holds the valve securely where it is set. Heat-Rite comes in a full selection of wall and baseboard models and return faces, in several finishes including new luminescent Dura-Lustre. For uniform satisfaction on your warm air jobs, use this moderate priced, dependable register. Genuine Auer Registers are made ONLY by The Auer Register Company.

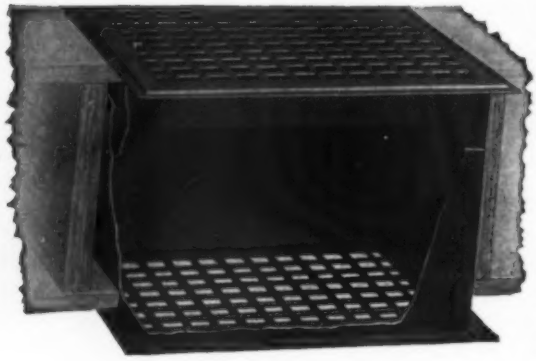

Fig. X

ADJUSTABLE CEILING VENTILATOR
Permits heat to pass from a lower to an upper room.

Ask for Auer Register Book, showing all models for air conditioning and warm air. Special Grille Catalog "G" also sent on request.

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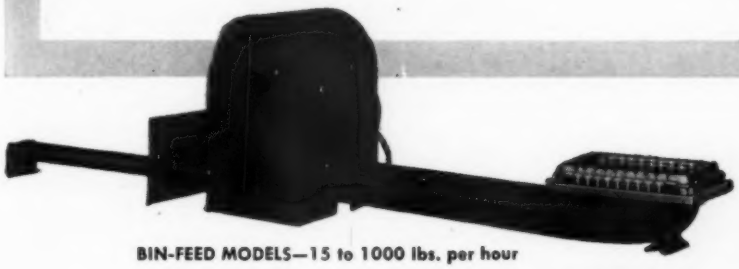
DEMAND TOP STOKER FEATURES

In the Combustioneer Automatic Coal Stoker . . . *and only in Combustioneer* . . . you'll find these exclusive features which mean greater satisfaction for your customers and bigger profits for you.

1. **The Automatic Respirator — patented and exclusive automatic air control.**
2. **The "Pulsating" Transmission — thoroughly agitates fire bed.**
3. **"Breathing" Fire Bed — most efficient. More heat per pound of coal.**
4. **Precision engineering and production, heavy duty construction for years of trouble-free service.**
5. **Pioneer leadership . . . more than 20 years experience in manufacturing, selling and servicing all types of domestic and commercial automatic coal stokers.**



BIN-FEED MODELS—15 to 1000 lbs. per hour

HOPPER MODELS
15 to 1000 lbs. per hr.

You'll Get Sales Helps!

Catalogues, folders, post cards, letters, cooperative newspaper advertising and many other selling helps . . . training for your salesmen and service men in our factory school . . . field men to assist you with sales and heating problems.

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AUTOMATIC COAL STOKER

THE STEEL PRODUCTS ENGINEERING CO., SPRINGFIELD, OHIO

The Steel Products Engineering Co.
1229 W. Columbia Street
Springfield, Ohio

Please send me, without obligation, full details of your Combustioneer Franchise.

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CITY_____ ZONE____ STATE_____

● Jobs move fast when you're hanging Berger ENDURO Stainless Steel Roof Drainage Systems. Because of ENDURO's high strength-to-weight ratio, sections are thinner and lighter . . . easier to carry and to hang. ENDURO's rigidity allows you to handle time-saving long lengths easily. And, pre-fabrication of complete systems is very practical for speed and economy without interference from bad weather.

Remember that 28-gauge ENDURO works as easily as familiar 26-gauge galvanized steel, and that it requires no special equipment. Your usual soldering practice is fine for joining. Use 50-50 or commercial stainless steel solders, with a large iron slightly hotter than you use for ordinary jobs. Immediately after soldering wash away *all traces* of acid or flux—using a 5% to 10% solution of washing soda and water. Remember to hang with stainless steel fittings and accessories, too.

The *full line* of Berger Roof Drainage Products made of Republic ENDURO Stainless Steel is available in local warehouse stocks. Your jobber can supply you. He can also furnish Berger Roof Drainage Products in galvanized steel and in copper.

Berger REPUBLIC STEEL

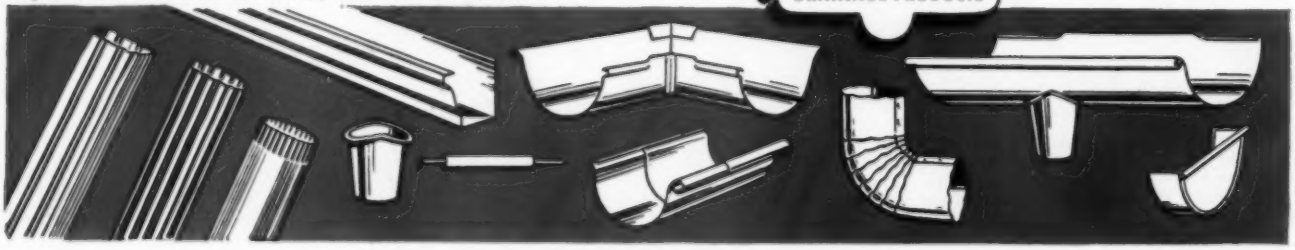
Manufacturing Division

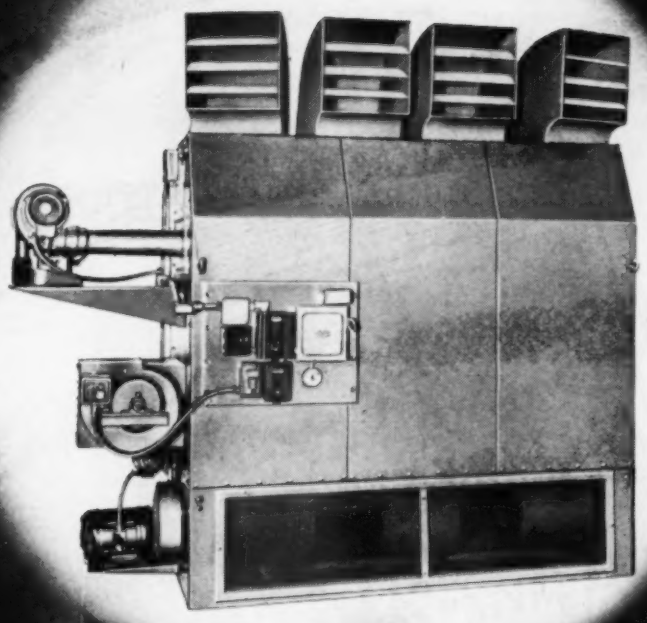
REPUBLIC STEEL CORPORATION • CANTON 5, OHIO

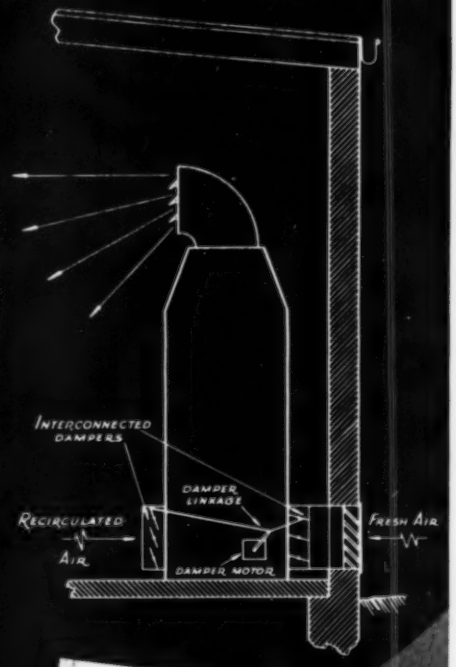
Warehouses in BOSTON, PHILADELPHIA and ST. LOUIS • Sales Offices in DETROIT, MICH., and INDIANAPOLIS, IND.

Berger Stainless Steel Roof Drainage Products include Snaptite Eaves Trough; "K" Gutter; Plain Round, Corrugated Round and Corrugated Square Conductor Pipe; plus a complete line of all necessary fittings. All are made of 28-gauge Republic ENDURO Stainless Steel, type 301, No. 2, satin finish.

BERGER STAINLESS STEEL ROOF DRAINAGE PRODUCTS







AIRTHERM

Provides You a Complete Heating and Ventilating System in One Compact Unit

Airtherm Direct Fired Heater installed for heating as well as ventilating. Fresh air inlet connection and interconnected dampers control flow of recirculated and fresh air. Designed to provide makeup air to balance vacuum effect resulting from exhaust systems. Ideal for summer ventilation.

The Airtherm Space Heater has been designed with extreme flexibility for heating as well as ventilating steel plants, foundries, all types of industrial buildings and warehouses. They are furnished complete with all operating and safety controls for automatic operation. Airtherm space heaters have a heavy duty steel combustion chamber lined with castable refractory for simple maintenance and long life.

Available in 9 models—oil* or gas fired—ranging from 650,000 to 1,950,000 Btu per hour output, in floor mounted or suspended types.

For detailed information write for Catalog 802

*Approved by Underwriters' Laboratories

For Heating Satisfaction . . . Think First of **AIRTHERM**

Oil or Gas Direct Fired Heaters | Horizontal Type Unit Heaters | Vertical Type Unit Heaters | Centrifugal Fan Type Unit Heaters | Convectors

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AIRTHERM MANUFACTURING COMPANY

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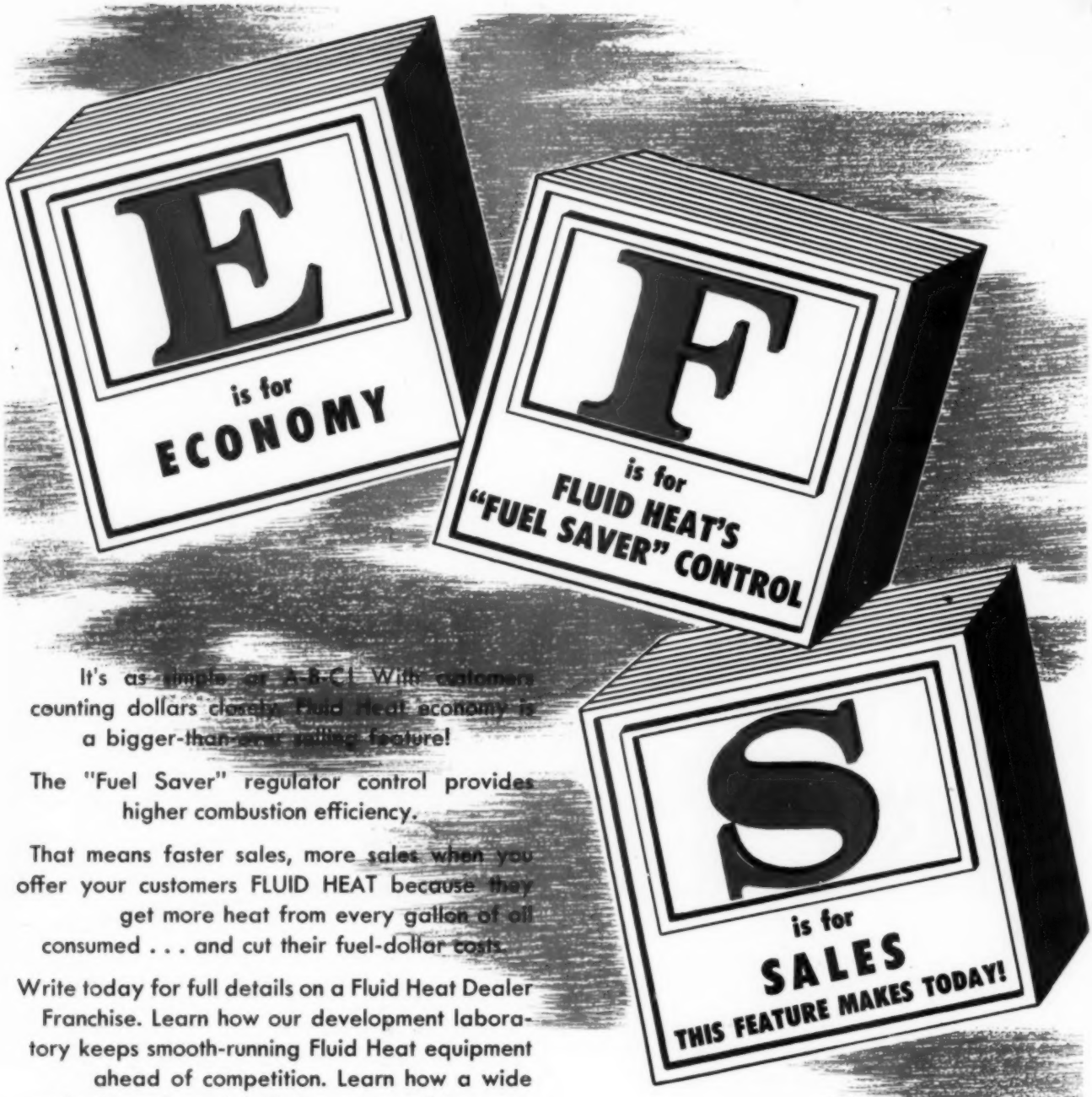


It's as simple as A-B-C! With customers counting dollars closely, Fluid Heat economy is a bigger-than-ever selling feature!

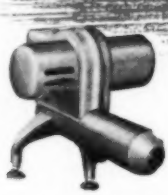
The "Fuel Saver" regulator control provides higher combustion efficiency.

That means faster sales, more sales when you offer your customers FLUID HEAT because they get more heat from every gallon of oil consumed . . . and cut their fuel-dollar costs.

Write today for full details on a Fluid Heat Dealer Franchise. Learn how our development laboratory keeps smooth-running Fluid Heat equipment ahead of competition. Learn how a wide selection of models helps you satisfy more people, make more sales!

FLUID HEAT OIL BURNER DIVISION,
ANCHOR POST PRODUCTS INC.,
6720 Eastern Avenue, Baltimore 24, Maryland.

ROTARY BURNERS



PRESSURE BURNERS

fluid heat
OIL BURNER
"WORLD'S ECONOMY CHAMPION"

Manufactured by Anchor Post Products, Inc.
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BOILER BURNER UNITS

AIR-CONDITIONING FURNACES

News Round-Ups

SENATOR TAFT ADDRESSES
warm air convention

THE NATIONAL WARM AIR Heating and Air Conditioning Association will hold its 36th annual convention December 14th and 15th at the Cleveland Hotel, Cleveland, Ohio.

A full two-day program of vast interest to the entire warm air heating industry with talks by individuals of national importance augmenting those who will report on the industry's progress is being arranged by the association's program committee, consisting of Harry C. Gurney, Surface Combustion Corporation, and John E. Peterson, AMERICAN ARTISAN.

Highlighting the program will be Senator Robert A. Taft, of Ohio, one of the most controversial figures in today's political scene.

Senator Taft, best known throughout the country for the Taft-Hartley Act, has recently been selected by a hundred Washington newspapers and radio correspondents as the one Senator who "contributes most to the nation's welfare."

One of the best-informed political figures, the Senator's talk will touch on current developments and information of interest both to the warm air heating industry and to labor with facts and figures to substantiate his statements.

So plan now to attend the convention and hear Senator Taft review the actions taken by both the 80th and 81st Congress, plus his views on what's in store for industry and labor during the coming year.

JUNE FURNACE SHIPMENTS

DURING THE MONTH OF JUNE shipments of warm air furnaces totaled 55,330 units, and represented an increase of 30 per cent over the 42,427 shipped in May. These figures have been published by the Bureau of the Census, Department of Commerce.

Solid fuel furnaces accounted for 26 per cent of the total or 14,425 units; oil fired furnaces were 30 per cent of the total or 16,829 units; and gas fired furnaces amounted to 44 per cent or 24,076 units. Winter air conditioning units made up 63 per cent of June shipments and the remaining 27 per cent were of gravity air flow.

HOUSING ACT EXPLAINED
by handbook

The Housing Act of 1949—what it is and how it works—is explained in a 30-page booklet, "A Handbook of Information," published by the Housing and Home Finance Agency and now available for distribution.

Operations authorized under the various provisions of the act—slum clearance, public housing, farm housing and housing research—together with a summary of the act itself, are given in this pamphlet which is designed to provide in layman's language complete information on all aspects of these programs. (The only provision of the act not covered is Title II which is a temporary extension of certain existing Federal Housing Administration mortgage-insurance operations for which further continuation is provided in other legislation being considered by Congress.)

Copies of this handbook of information on provisions of the Housing Act of 1949, are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 15 cents a copy.

News Round-Up

RESEARCH RESIDENCE NO. 3

REPRESENTATIVES OF NEWSPAPERS and periodicals of all kinds were the guests of the National Warm Air Heating and Air Conditioning Association on September 22 at a press preview of the new Research Residence, Urbana, Illinois, the third such house to be built for test purposes. Formal

dedication of the residence took place on September 26 with the members of the research advisory committee on hand to take part in the ceremonies.

The residence, shown in the photo, is a 4½ room structure that was designed and built to be typical of today's low-cost construction. Using a concrete slab floor the house will test four different types of heating systems during the coming winter. First to be tested will be the perimeter system that is described in a series by Professor Konzo now running in AMERICAN ARTISAN.

HOUSING STARTS

HOMEBUILDERS CONTINUED THEIR BRISK PACE in August, starting 98,000 new permanent nonfarm dwelling units, an increase of 2,000 units over July and 11,400 over August 1948, the U. S. Labor Department's Bureau of Labor Statistics announced.

August marked the fourth successive month in which new homes were started at about the rate of 100,000 a month. Moreover, homebuilding activity this past summer, as measured by new units put under construction, was at the highest monthly level on record for June, July, and August.

Preliminary Bureau estimates show a nation-wide total of 647,500 new dwelling units started during the first 8 months of 1949, only 2 per cent, or 11,700 units, under last year's total for the same months. The gains this year result from continued increases in rental accommodations (units in 2-or-more family structures) and publicly financed housing begun by State and local housing authorities. Almost 28,000 new publicly financed dwellings have been put under construction thus far in 1949, compared with 8,800 units started during the 1948 January-August period.

OIL BURNER SHIPMENTS

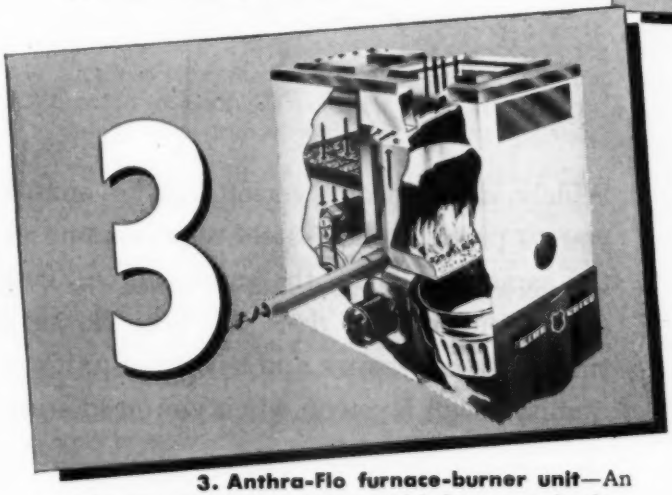
JUNE SHIPMENTS OF OIL BURNERS amounted to 34,209 units including both residential and commercial sized units. Of this total 32,555 were residential burners. Total shipments indicated an increase of 34 per cent over May, 1949 when 26,617 burners of all types were shipped. There were 7,169 furnace-burner units shipped in June as compared with 5,535 in the month of May.

THESE THREE can give your customers

automatic heat plus savings up to 52% on fuel bills

1. Automatic Anthracite Stokers—Installed in an existing boiler or furnace, or in new houses, automatic hard coal stokers deliver *plenty* of heat quickly . . . save up to 52% on fuel bills . . . eliminate fuel worries.

2. The Revolutionary Anthratube—The Anthratube saves on fuel bills . . . its proved efficiency is over 80%. This scientifically engineered boiler-burner unit, with "Whirling Heat" and other revolutionary features, produces quicker response and superior performance than units using other types of fuel. Fully automatic.



3. Anthra-Flo furnace-burner unit—An entirely new type furnace-burner which features a simple burner mechanism, attached by two bolts with all working parts easily accessible. Fully automatic, coal feeds direct from bin across single *stationary* perforated plate . . . ashes discharge by gravity into container within unit. Available for steam, hot-water and warm-air heating systems.

TODAY YOU CAN OFFER YOUR CUSTOMERS *modern* automatic heat with anthracite equipment.

You can show your clients how to save money . . . as much as $100 to $200 every year and yet have *plenty of heat—clean heat—even heat*—and no worry about future supplies or deliveries.

For complete information about (1) new anthracite stokers (2) revolutionary Anthratube or (3) Anthra-Flo, just fill in and return the coupon below.

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Call RYERSON

Wherever you are in America, there's a well stocked Ryerson steel plant within quick shipping distance. From thirteen strategically located points, Ryerson carbon, stainless and alloy steels in thousands of kinds, shapes and sizes are ready for immediate delivery.

By carefully specifying and checking, we are able to certify to the consistently uniform high quality of our steels. And to help you select the type best suited to the job at hand, the services of experienced Ryerson specialists are always yours for the asking.

Widely diversified Ryerson stocks enable you to procure many steel requirements at the same time from the same source. One order—one invoice does the job. So save time, save paperwork and be sure of uniform quality. Call Ryerson when you need steel.

PRINCIPAL PRODUCTS

BARS—Carbon & alloy, hot rolled & cold finished

SHAFTING—Cold finished, ground and polished, etc.

STRUCTURALS—Channels, angles, beams, etc.

TUBING—Seamless & welded mechanical & boiler tubes

STAINLESS—Allegheny plates, sheets, bars, tubing, etc.

PLATES—Sheared & U. M., Inland 4-Way Floor Plate

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal working

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON
PHILADELPHIA • DETROIT • CINCINNATI • CLEVELAND • PITTSBURGH • BUFFALO
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RYERSON CERTIFIED STEELS

RYERSON STEEL

AMERICAN ARTISAN

Pension Plans Confront American Business

NEARLY everyone interested in the case was surprised by the moderate tone of the recent decision made by the fact finding board which President Truman appointed to mediate the steel dispute. Instead of granting all the union's demands, the board stated in no uncertain terms that labor had been quite well taken care of in regard to wage increases. The board expressed concern for stockholders of the steel companies, which was not only refreshing but quite startling because stockholders are silent participants in such disputes. It rapped the steel companies for their use of profits to provide funds for expansion instead of paying larger dividends and resorting to long-term borrowing to finance new facilities.

In the field of social welfare, the board had some opinions to offer which were a bit startling also. According to the fact finders, the temporary and permanent depreciation of the human machine should be one of the first charges against business revenue. This depreciation should be offset by pension funds, the entire cost of which should be borne by the companies involved.

Industry has not been slow to adopt the principle of providing for the future security of its workers. It has done so after providing for the future security of the business itself. Rather than regard the security of the worker as one of the first claims against revenue, management has held that a company's first obligation to its employees is to stay in business. It might be quite well to adopt the principle that the worker comes first, but when a company fails, the workers are in a much more untenable position. It is thus apparent that management has accepted the principle of providing for the future security of the employee with the understanding that the future security of the business also be assured.

Finding little quarrel with the validity of pension plans, what is industry's attitude toward the statement of the board that industry should bear the entire cost of the welfare programs? The Federal Old Age and Retirement Benefit system which was adopted over a decade ago was founded on the principle that the employee should share in the expense of safeguarding his own future. It was the opinion of Congress at that time that the only fair way in which to operate such a program was on the basis of cooperation between the worker and his employer. Also, every state pension fund that has been established in this country has been established on the same basis.

Pension plans which have been put into operation by many companies in a number of industries have provided for employee contributions. Participating employees have been willing to contribute to their own security with the assistance of their employers. Paternalism has not been popular in American industry and when the worker knows that he is contributing to the pension fund he is more conscious of its benefits and feels a closer identification with it.

Yet, in spite of the history of employee contributions to pension funds, the fact finding board has now advocated company-financed plans. Where is the logic in this proposal? The Federal Government social security plan provides for employer and employee sharing the expense and yet a government appointed board now advocates a different principle. There is a lack of consistency in this recommendation which is at variance with the rest of the board's decision.

This point will probably be settled at the bargaining table and it seems to be the major obstacle to settlement of all the issues in dispute.

The Editor

Dealer Relations and The Manufacturer

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With the return of competition to the heating industry the relationship between manufacturer and dealer becomes of prime importance. Here an experienced sales analyst shows how essential it is to keep dealers informed and enthusiastic about the lines that they carry.

THE warm air heating industry is faced with competitive selling conditions resulting from productive capacity catching up with consumer demand for the first time since 1941. Expansion of production facilities of many furnace companies during the past few years and entry into this market of a number of companies which were not in it before the war is inevitably going to result in a readjustment period which will be characterized by considerable change in dealer and jobber alignments.

Practices Will Change

Since early in the war many manufacturers have been tolerant of practices by established dealers and jobbers which now will be open to question and to some extent eliminated. Many dealers have taken on competitive lines in order to have adequate supplies to meet the unprecedented new building and replacement demands. Inability of normal sources of supply to furnish sufficient furnaces made such moves imperative. Many of the newer organizations in the field or those which had greatly expanded production facilities, took this opportunity of gaining acceptance with the objective of getting the dealer to switch from established connections to new lines when supplies exceed the demand.

Now, to get into new markets in times of shortages is one thing, but to stay in these markets when traditional sources of supply can be relied upon for all sales needs is another. More is involved than just having good salesmen in the field. True, without good salesmen who can sell under real competitive conditions, the task is well-nigh hopeless, but many good salesmen are defeated by conditions entirely beyond their control. At a time like this it is particularly necessary to study impartially all of the factors that influence dealer or jobber acceptance and enthusiasm for a product. Such study should be an established and continuing part of any merchandising activity, and should include not only dealer relations but relations with all who can in any way influence the acceptance and marketing of the product. In this discussion we will confine our consideration to the dealer and jobber phase of the problem only.

Analyze Dealer's Position

The first step in dealer and jobber relations is to analyze and fully understand and appreciate the dealer's point-of-view in his relations with the manufacturer. When this is understood then every move which will have bearing on relations with the dealer or jobber must be analyzed, not only as to immediate effect but also as to long run effect and how it will tie in with other company plans and policies. For example, it may be advisable to discontinue manufacture of a certain product or products, if, by so doing, increased sales volume in other products can reasonably be expected to equal or better the sales volume of the product abandoned. In the lines of many manufacturers are products whose sales volume is low. If the advertising and sales features of these products are in conflict with other more profitable products in the line, their presence not only scatters sales effort but may open up avenues for competitive activity by showing inconsistencies in the advertising and sales story.

Dealer relations are maintained by the individual salesmen, by sales management and by sales letters and bulletins. The value of good salesmen is beyond question. But any salesman must be backed by sound sales management and one of the factors contributing to sound sales management is a policy of sound personnel selection. If there is a continual turnover in either the sales force or the sales management group with whom the dealer has direct contact, the value of confidence built up through long association is lacking. In fact, continual change of personnel, particularly if built up by advance publicity, may actually lead to a breakdown in confidence.

Sales letters and bulletins are quite important in this matter of establishing good dealer relations, and if originating from more than one source within an organization, there should be a central clearing arrangement so that duplications

or inconsistencies or contradictory matter can be eliminated before they reach the dealer to cause irritation. Without a coordinated system it is possible to load dealers down with duplicate requests for information, requests which if received in too much volume rightly end up in the round file under his desk. That doesn't get the information needed and it may cause the dealer to be disturbed about the direction of company policy.

All advertising, to the dealer or to the public generally, can have a definite bearing on dealer and jobber relations. If advertising is loaded down with superlatives, dealers who have handled competitive lines, in all likelihood, will not be overly impressed and may be disgusted with such obvious overselling. Statements that any of a dozen competitors can and most likely are making do not improve dealer respect for the products or the company. Such statements imply lack of real sales features, for if sales features exist that are exclusive they would be used. Even an advertising slant done for the purpose of building the dealer up with the customer can backfire if it is founded on unsound facts. Take, for instance, the claim that all dealers are factory trained experts, when the dealers know that 80 per cent or more of their number have never even seen the factory. On first impression such a statement is going to make many dealers feel mighty good to be so described. But when the dealer thinks about this, it can lead to doubt as to the veracity of other advertising claims, some of which may be perfectly true.

Overselling Dangerous

Overselling in advertising often leads to the development of sales resistance, rather than to increased sales and, in fact, often creates a sales problem where conservative advertising will create sales assistance. For example, presume that a new furnace has consistently operated at a fuel saving of 22 per cent over that of competitive furnaces. A few instances have been observed when savings as high as 25 per cent were reported, but this admittedly is unusual. Now how should it be advertised? If a fuel saving of 20 per cent is claimed, it is a good bet that in almost all cases savings will actually exceed this figure. The natural reaction of an owner when a product does better than he anticipated it would do, is to praise it loud and long for it proves his wisdom in selecting that furnace. But perhaps we advertise it to save 25 per cent of the annual fuel bill. A few furnaces may do that, but many probably will fall short by a bit. They will be just as successful as if we had advertised them to save but 20 per cent, and they are a big improvement over competitive units, *but* they are not performing up to the advertising claims we made for them. The answer, a certain number of mighty unhappy customers, who will be the worst advertising you can possibly get for the product. And it won't help your dealer or jobber relations either.

Variety Confuses

The multiplicity of units in a line can be a valuable asset. However, when carried too far, this great variety can result in conditions where a dealer or jobber cannot possibly stock the entire line, and where confusion results from units within the line which actually have contradictory sales points. There are sound sales arguments for some of the special purpose units, and a fairly wide range of sizes, but as heating and heat loss calculations are not an exact and precise science, the fact that a special purpose furnace may save up to 10 per cent in annual fuel costs is not always a fact that can bear careful analysis. This percentage in fuel cost for the average small residence or even medium size residence is a matter of from $7 to $15 a year, which in itself is not a sizeable sum. If, to get this saving, additional costs are incurred in the installation of a special purpose furnace, the additional cost of amortization of the original investment in the heating system may knock out all justification of such an installation. It may be that the manufacturer with but a few lower cost units which can be adapted to most requirements, may be able to prove a better economic story than the one with lots of highly engineered, high efficiency products.

Another consideration is whether it is necessary to make yearly changes in units just for the sake of change. Many of these changes are so minor that neither the dealer nor the customer has any interest in them. Continual changes in model designation in addition to giving an impression of instability, tend to confuse everyone who has to use these designations in correspondence and to increase probability of error. It is essential that there be continual engineering advancement, but, this is best based on conservative engineering progress and not the whims of the moment to meet an immediate market condition that may be temporary. Every engineer wants to see his latest brainchild out amassing big sales totals and profits, but incalculable harm can result from too hasty introduction of units not properly tested or perfected. Such conditions result in costly service calls for the dealer. Even if this service is paid for by the manufacturer, it takes the dealer's time and labor that might be spent more profitably in developing new sales.

Unit failures can have a demoralizing effect on product acceptance within a considerable radius from the place of failure, particularly if the customer has any influence in the community. This, in turn, can have a serious effect on the business prospects of the dealer and often gives competition a strong talking point. There is no justification for putting untried products on the market, regardless of how perfectly they operate in the laboratory. Only in field testing, under conditions to be expected in normal daily operation, for at least one complete season, is it possible to determine the real operating characteristics of the product. It is a very different thing for a customer to know that he is sharing in an experimental test, than to have him believe he has purchased a tried and proven product.

Factory Help

With any mechanical equipment, service help from the factory is going to be needed from time to time. The cooperation and efficiency of this service can have a definite bearing on dealer relations as can the availability of replacement parts needed for emergency repairs. Another important consideration is the ease of handling

of the products and the availability of thorough and easy to follow installation instructions that will reduce installation time to a minimum, and increase dealer profits.

If a company manufactures competitive products under different brand names, or is a part of a corporation controlling several different producers, the relations of each of these parts should be coordinated, for the action of any one may seriously affect acceptance of the products of the others. In this day of lively competition it is practically impossible to keep these connections from becoming known; and the best way to face such a situation is to honestly acknowledge all the connections. If the policies of any of the group are in conflict with straightforward merchandising policies, then it would be well to make internal changes before competition creates an untenable situation.

A full knowledge of competitive activities and developments is a valuable asset, for with it you can anticipate possible competitive action in the field that might directly or indirectly affect dealer relations.

This whole matter of dealer and jobber relations is of course more critical with dealers who have had but short association with a manufacturer than it is with dealers and jobbers who have had loyalty and interest built up through long association. A dealer or jobber who has gone through the tough competitive years from 1930 to the war, then who hung on through the war trials and tribulations is probably pretty well sold on a line. Dealers or jobbers acquired since 1945 have not had experience under tough selling conditions, and if they had previously handled competitive lines they have a tendency to compare present conditions with those of their past connections and are likely to be much more critical than the long term dealer. This is not to say that the latter is entirely happy about everything for, in fact, the older dealers can often be the source of information that can be of invaluable help in formulating policy.

Whether the facts that are learned by careful field study and review of company policies are pleasant or not makes little difference, for they are facts that exist. The more we know about actual conditions, the more intelligently we can plan for long run activities to assure dealer allegiance and cooperation. If we close our eyes to facts we may be able to force acceptance of our products for a while but eventually reaction will occur. This is the time to work hard on all phases of dealer relations in order to have a strong organization for the competitive fight ahead.

A. M. Vorys

Functions of the Wholesaler in The Warm Air Heating Industry

Arthur M. Vorys, president of Vorys Brothers, Inc., spoke before the recent convention of the National Association of Heating Wholesalers in Chicago. The ideas expressed were of such general interest that his talk is reproduced here.

IN THE May issue of Dun's Review there is an article *"The Key-Note of Today's Economy."* I want to quote a little from this article, which begins with the statement "Effective distribution is the leading problem of Modern Industry."

"An incredibly few years ago, the great problem of American industry was production. Scarcity determined values. The manufacturer, the engineer, was the key man. New methods, economical processes, short cuts, were the focus of men's thoughts.

"Distribution was taken for granted. Need for more articles ran ahead of purchasing power. The travelling salesman and the retailer were held in low esteem.

"Today production is no longer a problem. It can be directed into any channels desired and fill the need and wishes of the population. Fear of surpluses, not shortages, determines values. An economy of plenty has replaced the economy of scarcity. Problems of marketing have taken the center of the stage. The rate of production depends upon the rate of distribution. The best brains in every business are concerned with distribution rather than production. Management stresses selling programs, pricing policies, advertising, and public relations.

"So gradual has this shift been that we are scarcely aware of it. Our practices conform to the necessities of the new order. But our habits of thought, our customs, our laws have not had time to adjust themselves. We still think in the terms and conditions we were taught in school and college. Our courts apply the Sherman Anti-trust Act of 1890, framed in response to the conditions of the 1880's."

Distribution, the division of wealth, the spurring of desire of backward people to want, the equalization of "supply and demand" of the world's consumable goods, has become more important than the production and manufacture of the goods. The wholesaler represents the main body of the flow of the distribution stream;

the other parts of this flow are the source, the manufacturer, and the branches, the retailers. Flow in this stream is similar to flow of water in an irrigation project. The head, the energy, the power, comes from the manufacturer flows through the wholesaler to the branches, the retailers, and is absorbed by the consumer. Each part of this distribution system is essential and has a function and cost of its own which cannot be absorbed by the others. There are not two channels, wholesale and retail, flowing side by side, but one main channel, wholesaling, which can only dispose of its load through retail branches.

There are so many schools of thought about distribution, and so many attitudes concerning different distribution problems and processes, that we must all become familiar with the same language, and what we are trying to do, before we begin to get technical about our own particular business as heating wholesalers.

It would be an amazing thing if this group could bring some order to the American business distributing chaos, not of planned economy, but of recognized competitive business channels of distribution.

Marketing Cooperation

Having discussed the channels of distribution, let us now consider how a manufacturer who has determined to manufacture only, and a wholesaler who has determined to wholesale only, can work together to the advantage of both, and also to the advantage and best interests of the retailer, contractor, and consumer.

It is unfortunate that we have so abused the word wholesaling, in our enthusiastic American way of exaggeration and bombast, that to the common man it means price instead of function. For instance, every day Government and business publish through radio and newspapers wholesale prices, which have nothing to do with wholesaling or the wholesale function. Daily in newspaper advertising the word wholesale is used as a synonym for cheap or forced sale, or below the market. Retailers and dealers, when selling another dealer or trading stocks with competitors, use the word wholesale to mean the price at which they sell others than consumers.

Manufacturers and wholesalers increase their overhead and their retail customers' costs and upset the whole distributing system by permitting friends, relatives and preferred consumers, to purchase from them without charging the retail cost of this retail service. However, since no one has coined a more descriptive word, we shall have to use the word wholesaler, and expect you to understand its true meaning.

There are two types of wholesaling, and most of us do a little of each.

First, there is the jobber or job lot or bulk-breaking purchaser of common commodities and merchandise in whose sales and purchase transactions there are no loyalties, no exclusives, no perceptible difference in the finished product of one manufacturer or another, no established tradenames, no finished product or consumer advertising. The sales of these jobbers are generally to manufacturers, either small or large, to become part of some finished product.

Then there is the wholesale distributor, who, after he chooses and is accepted as representing a manufacturer, expects to become an integrated part of that manufacturer's selling and distributing program. Their problems, their mutual success and failure are one. They are doing business together. The first type of wholesaler, the manufacturer sells *to*, the second type, the true wholesale distributor, the manufacturer sells through.

Legislation No Answer

Recently I asked one of our colored employees what he thought of the F.E.P.C. bill in our local legislature. His reply was, "you can never legislate racial equality and Christian Brotherhood. It is a matter of the heart rather than law. It is as impossible to enforce on an unsympathetic population as prohibition was." He does not feel that racial equality and Christian Brotherhood are impossible, but the idea must be sold to the people and not forced on the people. This group of heating wholesalers has the same problem. As wholesale distributors, we must sell an idea to manufacturers, wholesalers, retailers, contractors and consumers, not try to force it.

Before we can criticize any other channels of distribution, we should clean up our own house and be sure we are not assuming functions which belong either to the manufacturer or the retailer. To pass this examination, let us ask some questions.

How can we, a national group, bring order out of chaos if we do not recognize our own functions? Are we manufacturing? If so, are we competing with manufacturers whom we are trying to represent? Are we retailing? If we are selling contractors, if we are assuming many of the functions of a retailer such as engineering, inspection, delivery, consumer display, long term financing, servicing, let us all recognize those functions as retailing. If we sell at extremely low prices to consumers, that is as cheap to some consumers and contractors as some wholesalers sell to retailers, let us recognize the fact we are retailing at low prices rather than call such retailing wholesaling. In this delusion, this misrepresentation, this confusion, lies all of the legal, moral, and economic misunderstanding of the whole heating business.

Wholesaling Defined

Wholesaling is the competitive performance of certain distributing functions, and it can be done on extremely low margins. Retailing is the performance of many distributing, advertising, servicing, financing and consumer selling functions, and generally requires two or three times the wholesale margin. Retailers can perform efficiently some wholesale functions, such as warehousing and delivery without adding much to their cost of doing business. Seldom, however, can a wholesale distributor assume many retail functions without adding enormously to his costs of doing business. If we could get a frank acceptance of these ideas across to those to whom we sell, and to those from whom we buy, we then would have made order from confusion, and still have the competitive American way of doing business. Having established the necessity to recognize wholesale functions and retail functions, and having explained what a heating wholesale distributor does, let us add two more functions to John Phillip's functions which a wholesaler performs for manufacturers and which are seldom recognized, but

which can never be obtained except by using independent wholesaler and retailer channels of distribution.

Functions of the Wholesaler

a) A wholesale distributor competing with other wholesale distributors on wholesale functions only develops the lowest costs. I defy any manufacturer to attempt to duplicate in a wholly-owned branch warehouse our warehousing costs, our sales, and delivery costs, or any of the costs which have to do with wholesaling only. By the same analysis, we have found that no retailer, regardless of his size, his plant, or his connections, can equal our cost of doing a strictly wholesale business. We test this every day as we have many products on which we receive no lower price than retailers do, yet retailers purchase from us because they just cannot perform the wholesale functions of purchasing, warehousing and packaging at our mark-up.

The fact that our salesmen in one call can service, sell, sales manage and engineer all the materials to do an entire job is an enormous saving in time for the dealer, and eliminates what would be hundreds of calls by different manufacturer's salesmen.

b) A wholesale distributor can represent several lines. Many manufacturers' salesmen cannot understand how we can serve two masters. Many manufacturers' executives will not think realistically to accept this idea, yet economically it was the great service performed by independent wholesalers representing several manufacturers, which was finally recognized by the War Production Board during the war as so important that our allocations came first. It is the continuity of performance for the retailer and consumer by the independent wholesaler representing several manufacturers, which bridges the gap and provides a steady, reliable channel of distribution during war, strikes, shortages of materials, changes in design, or transportation difficulties. Although often abused, the independent wholesale distributor function of being able to substitute and supplement a main line is most important and in the long run, is most helpful to the manufacturer who often is quite vehement in asking for exclusive franchises.

When a manufacturer entrusts all of his wholesale functions to another organization, and that organization accepts, they have both accepted responsibilities which should not be treated lightly.

c) Financing, warehousing, purchasing in large quantities, are wholesaling functions, and the cost of them should either be assumed by the wholesaler, or if assumed by the manufacturer, should be charged to the wholesaler. Surely that wholesaler who buys in quantities at shipping schedules favorable to lower the manufacturers' cost, should receive a substantial saving over any other wholesaler, mail-order house, retailer, or farm cooperative.

d) Wholesalers when they have been entrusted with a manufacturer's line should be loyal, giving these products every chance to meet competition and prices that they would if they were all one organization. The manufacturer in turn, should not continually seek new outlets especially when the demand for his product comes from the wholesaler's activity and sales work.

e) Wholesalers should help the manufacturers get rid of their mistakes, to liquidate their obsolete models. Merchandise made must be sold. Either take your responsibility of moving it, or expect it to crop up to compete with you through other channels. The manufacturer, however, with more care can give warning of model change, can give discounts on obsolete merchandise, and withhold information on new models, so that wholesalers and retailers can get rid of their mistakes too.

f) Wholesalers should be as careful in protecting their retail outlets as the manufacturer is expected to be in protecting the wholesaler. A good rule for a wholesaler to follow is, if a customer sells and then buys, he is not a wholesale buyer. If he buys and then sells, he is a true retailer, or dealer.

g) There is no place in wholesaling or retailing for cooperative quantity buying arranged for by the seller. If my company wishes to combine purchases with a competitor, dividing our purchasing power, we should make the arrangements. But, any wholesaler or retailer who shares his buying power by purchasing in pool cars, or combined shipments without knowing and supervising his own purchases, is tearing down his own competitive position, and inviting unethical and inexperienced competition.

h) A wholesaler is supposed to furnish salesmen and representatives who are capable of demonstrating, selling, and engineering the manufacturer's line. These salesmen should be able to help dealers sell and advertise, install, service, engineer and finance. They should be familiar with all dealer problems, such as building codes, utility competition, inspection, fire laws, etc.

A manufacturer may need a salesman to make first contacts with a distributor, and to sell the wholesaler on representing him, but after the wholesaler has made his decision to handle the line, he no longer needs a salesman calling on him or in his territory. No longer does the relation of buyer and seller exist. Sales by a wholesale distributor mean orders for the manufacturer. They are now married and cooperatively should build a family of dealers. It is natural for consumers to look up to and respect the retailer's salesmen, and the retailer generally looks to the wholesaler's representative for guidance, information and enthusiasm. Since a wholesale distributor's salesmen do all the selling for a manufacturer, the contact man or representative between the wholesaler and manufacturer should be of sales manager calibre. He should be an inspiration and fountain of enthusiasm, and sales promotion help to distributor's salesmen and dealers.

For the Good of the Industry

There should be no competition between manufacturers, wholesalers or retailers. Our aims should all be the same, to move the largest amount of heating equipment, for returning to Duns' article, "competition is no longer within an industry, it is between industries." If heating manufacturers, wholesalers, and retailers assume their proper functions, we can secure a larger share of the consumers' dollar, and thus contribute our share to the essential human requirement of comfort.

Lost Customers Bring 'Em Back Active!

DAVID MARKSTEIN
New Orleans, Louisiana

Your best propect list should be the customers whom you have served in the past. If they have received the right treatment and service from you, they will surely return when they need a product or service that you can supply.

MOST *Indoor Comfort* dealers know how much sales volume varies during a year. They also know how many people like the work they do.

But few keep a record of the lost customers—lost because of dissatisfaction with work or service, or because of any one of the hundred and one reasons why people change their buying habits.

All Out for New Business

It is unfortunate but true that many *Indoor Comfort* dealers are so intent upon lining up the new customer that they totally abandon the fellow who a year or three years ago was a valuable man to have around, the old customer.

Here is an example of the consequences of this neglect of former customers.

A few months after the war ended, a contractor noticed a leveling off in his volume of sales. Until then, the sales curve had shown a steady rise. Now sales were remaining at a level instead of rising continually.

At first, the owner wasn't worried. "All business is bound to level off," he reasoned, "and I can't expect mine to be an exception. The economic experts say there may even be a recession or a depression. Nothing I can do about it."

It wasn't many weeks, however, before he noticed that the volume was not merely leveling off, it had now begun to drop. Again, he reassured himself with platitudes about the falling-off of customer demand.

Then one day he had lunch with a friend, and asked him the routine question, "How's business?" The answer startled him. The friend's business was booming.

Back in his office, the *Indoor Comfort* dealer wondered: Was it tough all over, as he had assumed, or was his business slipping because he had neglected to devote attention to selling new customers? He decided to embark on an advertising campaign.

The campaign paid off and he saw the volume figures begin to grow again. But he discovered another disturbing fact: Everybody's sales were jumping, and his were not keeping pace with the rest of the field.

Sales Conditions Had Changed

At last, by diligent study of the accounts and books of the company, he discovered the right answer.

His wartime customers were willing to accept shoddy work and slow service because the kind of work and the fast delivery they wanted wasn't to be had. When the war ended, he hadn't taken note of the fact that competitors stepped up the quality and the speed of the work they were delivering. He had been content to plug along in the wartime way.

As a result, the growing customer trend to buy elsewhere became a positive habit. Advertising to bring in new customers made the books show a temporarily brighter picture, but without the kind of service his competitors were offering, he hadn't a ghost of a chance to keep the new customers. They gave him a

try, then joined the legion who had taken their dollars elsewhere.

When this dealer finally discovered his trouble, he launched a sell-'em-again program that really pulled in the returns. Here is the advice he offers for getting old customers back in the fold:

"First," he points out, "you have to find out why they left you. Maybe your work was at fault. Maybe it was one of a hundred things. Studying the books, racking your memory, and talking to the salesmen will give you a pretty good idea of the reasons.

Keep a record of customers and refer to it often.

"Next you must convince the old customers who have abandoned you that conditions (or work) to which they objected in the past no longer exist.

"Then, finally, we found that keeping old customers on the sales hook must be a continuing job. You've got to keep up a program like this all the time."

It is good selling sense that an old customer is worth more than a new one. He is already familiar with your work. He must have at least some liking for you and the way you operate, or he would not have been a customer in the first place. More often than not, it was some small annoying thing that drove him away.

Easier to Sell

Most experienced sales promotion men agree on two things in regard to this old customer who has ceased buying for one reason or another: First, it is easier to bring him back into the fold than it is to make a new customer out of a cold prospect. Second, as a customer, he is more valuable than the new customer who is not yet completely sold on switching his buying allegiance.

It's a good idea to sit down and look over the situation every six months. Ask yourself this question, "How many new customers have we gained the last half-year, and how many old customers have we lost during that time?"

It is impossible to keep every customer. Sometimes the smartest and smoothest customer relations and sales promotion ideas won't do the job.

But, making a sincere effort to keep the customers you have will mean that you are maintaining a sound basis on which to build new business.

One Man's Technique

In a small western town, the community's only heating and air conditioning contractor faces competition only from nearby cities. But he is smart enough to keep up a continuing selling campaign to see that customers do not lose the habit of coming to him.

"Periodically," he says, "I make what I call a customer check-up. I go over the books and talk to the salesmen to discover whether we are losing old customers at a rate that's faster than it should be.

"Then I do the most important thing, I try to chart *why* we lost the customers who deserted us during the check-up period. The salesmen and I go over all the possible and probable reasons. Then we single out the three or four reasons that recur frequently. This is what you might call an old business diagnosis. We mull over the symptoms to find the basic causes for losing valuable customers.

"Finally, armed with a good knowledge of why customers turn away, we can try to do something about it. Opposite each of the reasons why we lost old customers, I jot down a idea, or several ideas, for re-selling them.

"After I've thought out the re-selling schemes I believe will work, I call another meeting of the sales force. The salesmen are the ones who actually meet the customers. They know a lot about the practical reasons-for-buying that I do not know.

"Together, the sales force and I discuss these suggestions. Out of the meeting, we get some solid ideas that to date have never failed to work. They are based upon the combined experience and selling brains of the entire organization. Often, the salesmen find flaws in a pet idea of mine. But it doesn't bother me. In return, they always come up with other ideas that are better."

After a method of re-selling the lost customers has been worked out, what then? How can it be put into effect?

"At the merchandising meeting with the salesmen, we map out the procedures. Some ideas can be put into effect best through advertising. Others require the personal touch of the experienced contact man. But the majority need a combination of both advertising and personal salesmanship.

"We decide upon the ideas that will bring the old customers back onto our account books, and after that we go over the tools we'll use to implement those ideas. Each selling scheme is subjected to a complete methods analysis. Every possible way in which it can be put into effect is considered by the group. Finally, we decide on one or two of the strongest suggestions, and discard the weak ones.

"At the end of the meeting, we have decided upon what should be done and, just as important as far as results are concerned, how it should be done."

Arnold Kruckman's

Small Business Fights for Life

GOVERNMENT sources report there are 10 depressed areas in the United States where unemployment exceeds 12 per cent. It is reported that metal-working plants and allied industries in Ohio, Illinois, Missouri, Kansas, and Nebraska have been particularly hard hit for various reasons. It has become customary to call smaller businesses marginal. The word marginal is often applied to a business that is having a hard time keeping its head above the economic waters. There is some reason for the thought that in the process of evolution, marginal businesses must disappear; but there seems something ruthless and unnecessary in the philosophy that this must be the effect of natural causes. Much could be done with great profit to help marginal businesses survive. A parallel can be drawn between planned efforts for this purpose, and the trend of the last 50 years to make life more tolerable for the lesser endowed humans whom science now keeps alive. The basic thought in the philosophy for the survival of human beings is that every living being has a right to life in reasonable comfort. On the same basis, the smaller units in business would seem to have the right of survival and protection from extinction by the larger units. Obviously the survival of the smaller units would spread work and preserve individual independence and liberty as well as maintain competition.

George Meredith Presents Case

The idea reflected above is to be put before President Truman by the National Alliance of Independent Business, of which George F. Meredith is the executive director. Mr. Meredith, as is well known, formerly was executive director of the Senate Small Business Committee, which was allowed to lapse last December. It was allowed to go under as the deliberate result of the efforts of a group of Senators on both sides of the aisle.

The communication to the President points out the difficulties of smaller independent business and strives to enlist the aid of the President in preserving its existence. The letter quotes from a letter sent to Congress by E. J. Nolan, Sr., president of Suburban-Essex Machinists, Inc., at Roselle Park, New Jersey. This firm builds machines and machine tools, fixtures, jigs, dies, precision parts, and conducts experimental work, model building, machine repairs, engine adjustments and industrial equipment. It is composed chiefly of members of the Nolan family. They are very proud of the fact that they have behind them three generations of skilled machinists.

Mr. Nolan's letter to Congress in part was as follows:

"I take the liberty of addressing this letter to you in the belief that it might be of some benefit to smaller business in my community. My firm, Suburban-Essex Machinists, Inc., of Roselle Park, New Jersey, formerly of Montclair, New Jersey, had an excellent record of service to both Army and Navy, in ordnance work, during the war and was quite active for postwar periods on contracts for Curtiss-Wright Corporation, Westinghouse Corporation, Electric Boat Company, Federal Telephone and Radio Corporation, and other customers. We received citations from the highest officials of the Army and the Navy, as well as from other heads of the civilian departments of the United States. Notwithstanding that we are experienced and qualified, and have a continuous good reputation for service, we are now unable to secure enough business to warrant keeping our factory in operation. This description of my firm's problems is substantially the story of all small businesses in northern New Jersey, and is the reason for this letter.

"My firm is only one of about 50 or more, ranging in size from a personnel of 50 to 200 employees, and accounting under normal conditions for a total employment of about 10,000 industrial workers. Of this number, more than half are fine well-trained mechanics such as tool makers, gage makers, die makers and machinists.

Section Highly Industrialized

"During the war, this section of our country was known to the War Department as 'Northern New Jersey,' and has been regarded for a generation as the second most highly developed industrial area in the United States, Detroit area being the first. An immense diversification of business exists here from paper making to synthetic diamonds, and from aircraft and radar down to iron pipe. It is possible to procure in some degree any kind of goods or services

Washington Letter

that exist anywhere in the world right here in Northern New Jersey.

"The hub is in Newark and fans out in all directions for 20 miles into communities like Union, Hillside, Roselle, Elizabeth, Perth Amboy, Jersey City, Hoboken, Bayonne, New Brunswick, Belleville, Plainfield, Kenilworth, and many others. If all of the facilities and equipment and potential manpower of the small business firms, especially engineering shops in these communities, were put together they would be about equal to the seven largest firms in this area, on whom we depend. These seven largest firms are: Curtiss-Wright Corporation, in Caldwell; Federal Telephone and Radio Corporation, in Nutley; Westinghouse Electric Corporation, in Newark; General Electric Corporation, in East Orange; Western Electric Company, in Kearny; General Motors Corporation, in Linden; and National Pneumatic Company, in Rahway.

Contracts Given Large Firms

"About two months ago a contract for $12 million was given to one of these large corporations; still later two more contracts for $100,000 each were awarded to the same firm. About the same time another great corporation in Newark was awarded a contract for $9 million, and another at Rahway was given a contract for $600,000. Many small firms, including mine, applied repeatedly for sub-conract work to these corporations. None of us obtained a single job. Most of these firms have completely dispensed with sub-contract of any kind, either private or Government jobs. One of the largest of these contracts was let from Watervliet Arsenal for whom my firm made hundreds of ordnance gages during the war. It is our feeling that the great contract just recently allotted could easily have been broken down in part, and that the work on spare parts could have been given to the smaller business firms. My view of the awarding of contracts en masse to the great corporations is about the same as that of most other small manufacturers in this area. How long will it be before we have half a dozen over-stuffed firms with business bulging out of their doors and small business with no work at all and completely ruined?

"Small businesses, or sub-contract firms are naturally regarded by large firms as mere appendages to their industrial resources, to be used or to be allowed to decay according to the needs of the great corporations. During the war great point was repeatedly made by Government, and by others, of the fact that everything must be done to keep smaller business units in standby condition so long as there was a threat of war. The small firms were given every encouragement, during the war, to make the necessary preparations to remain in existence. If another war emergency were to occur, it would assuredly take a full year or 18 months to build up such secondary resources again. By that time most of us would be out of business. Incidentally, more than 75 per cent of the gage work for Army and Navy during the war was done in factories which were specifically classified as small business.

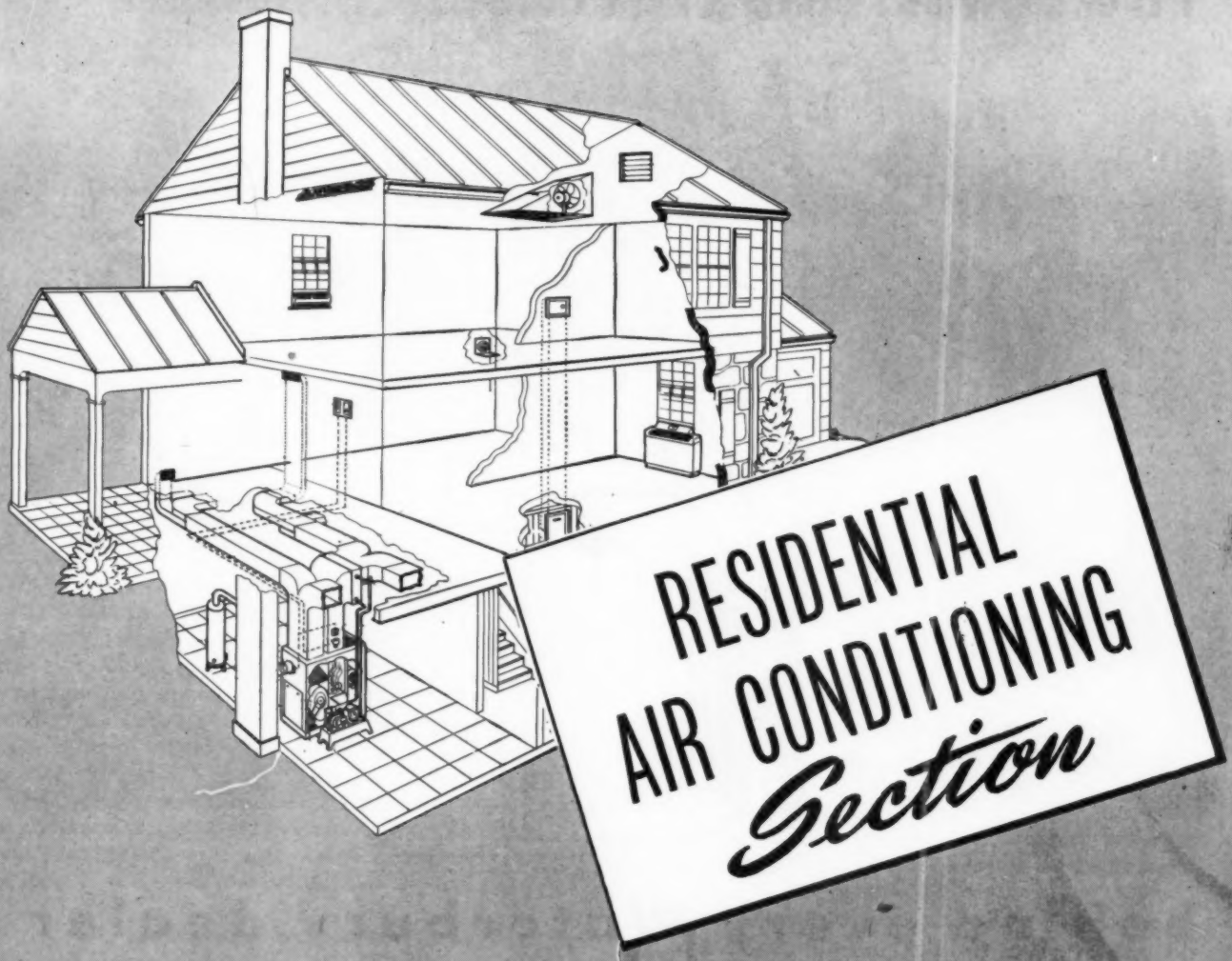
"It is to be presumed that procurement officers have a greater confidence in the ability of a large firm to fulfill a large contract than in many small ones to do the same job; and they may even entertain the belief that the large firms will sub-contract a percentage of the whole to small business, following the practice that obtained during the war when contracts contained a 'required delivery' date; but there is no such pressure upon them now. The only way you may aid small business to secure sub-contract work from large firms having Government contracts is to put such a requirement in the contract, or reserve contracts under half a million dollars for small business only. Most of the contracts awarded to large firms never come to the attention of small business units for bidding, or for negotiation. We only read about them later when the job is under way.

"I hope that these few thoughts will be of help to you gentlemen of Congress in acquiring an accurate perspective on small business conditions, and I trust that you do not deem me presumptuous. I speak for myself only, and I ask nothing. My firm is in no worse condition than two dozen others in this locality. It is the condition itself that I wish to point out."

Small Business Legislation

Congressman Wright Patman, on behalf of the House Small Business Committee, introduced recently a bill which, if enacted, would oblige all Government agencies which let contracts of any kind to give some of the work to smaller business. The bill, however, is indefinite; it does not specify that sub-contracting shall be required, nor that contracts below a certain minimum should be let to the smaller units. The objection of the procurement officers in the armed services to any mandatory legislation is that they are already organized to give smaller business any contracts which they deem appropriate and feasible. The armed services have set up a great paper body of procurement experts who presumably devote their entire time to channeling business to the smaller units. Thus

(Please turn to page 154)



RESIDENTIAL AIR CONDITIONING *Section*

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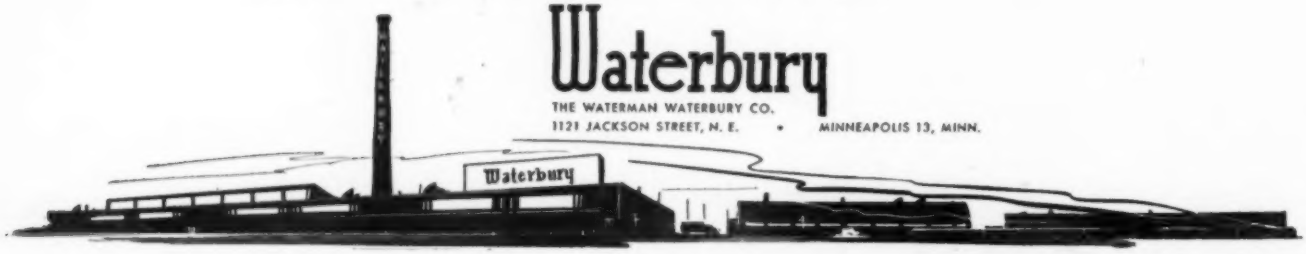


Heating Basementless Houses with Warm Air

Questions & Answers

PART 3

S. KONZO*, W. R. HEDRICK** and
J. M. DAVID***
University of Illinois

IN PART 2 of this series a suggested design procedure for a perimeter warm air heating system was presented. It is easy enough to combine a few figures and offer them as a design procedure but it is not so easy to defend the method, particularly when test data are lacking. Someone has to break the ice and attempt to use a rational engineering approach to a most complicated problem. The questions and answers in this section were prepared for the information of the heating contractors and engineers who may want to know what assumptions were used and what evidence exists for some of the assumptions that were made.

Assumptions Are Tentative

Any analysis of this nature will necessarily have to be considered as tentative and subject to later revision. Such an analysis is valuable, however, in bringing out the type of information that is needed to confirm some of the assumptions. It is hoped that the proposed research of perimeter warm air heating by the National Warm Air Heating and Air Conditioning Association will afford some means of determining how valid the assumptions are and whether some of the safety factors can be reduced. A perimeter system is among the first heating systems to be studied in detail in Research Residence No. 3, recently constructed by the association. This project is under the general direction of Robert W. Roose, special research associate, University of Illinois, and tests in the residence will be conducted by Morris E. Childs, special research assistant. The first report of the tests will probably be available in 1950.

Q. 1. *Loop Layout.* How should loops be designed when the furnace is not centrally located?

A. When considering two loops for a floor plan, four items are important:

a. The two loops should be approximately of equal lengths. The variation should ordinarily not be more than 10 ft, and in no case more than 20 ft.

b. Length of the loop should not exceed 90 ft, measured from the bonnet, around the loop, and back to the bonnet. This limit is imposed to prevent excessive drops in the temperature of the air flowing in the duct.

c. Each of the two loops should supply approximately equal heat loads. The maximum variation allowed is 60 per cent of the total heat load for one loop and 40 per cent for the other. Since the maximum heat loss for the structure has been limited to 60,000 Btu per hour, the maximum capacity of one loop is 60 per cent of 60,000, or 36,000 Btu per hour.

d. Two loops, not more than two, are covered by this design procedure.

Fig. 1 indicates the manner in which the above restrictions can be incorporated in a number of floor plans. Fig. 1a shows an ideal arrangement in which the heater room is near the center of the house. The feeder ducts (those which carry the heated air from the bonnet to the outside perimeter duct) are nearly the same length, and the heat load for each loop will be nearly the same. Fig. 1a, 1b, 1c, and 1d are variations of the ideal design and represent possible layouts for those cases in which the furnace room is not in the center of the house. The arrangement in 1d is not entirely satisfactory because the long feeder ducts running through the middle of the house may cause floors over the ducts to become hot and at the same time result in low air temperatures at the far outlets. If possible, the furnace room should be nearly central, or the feeder ducts should be insulated to reduce the amount of heat transmitted to the floor above. Arrangements possible for L-shaped and U-shaped structures are shown in 1e and 1f. The use of multiple furnaces for zoning is indicated in 1g and 1h.

*Professor of Mechanical Engineering.
**Former graduate student, now with Surface Combustion Corp.
***Graduate student.

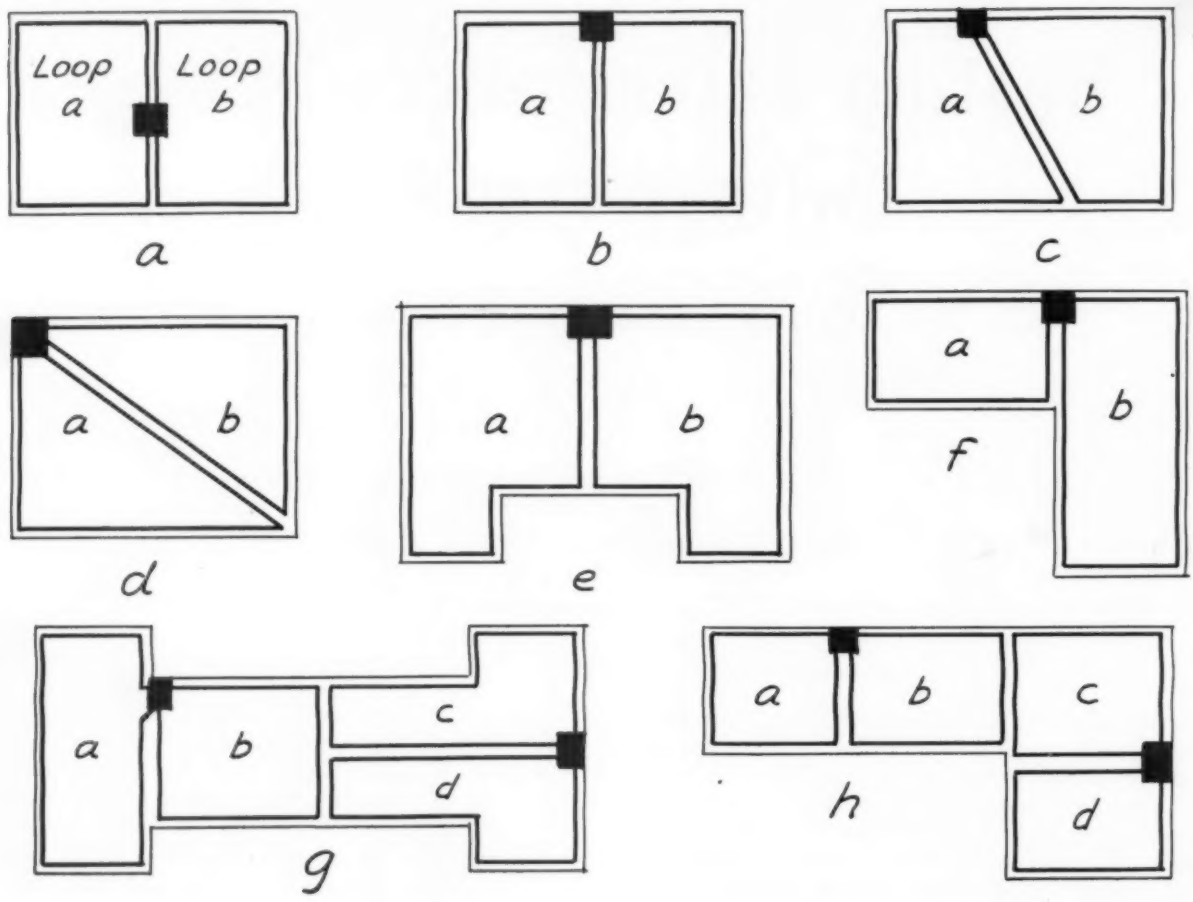


Fig. 1 Various loop arrangements.

Q. 2. *Individual Feeder and Single Loop Arrangements.* Why not omit the perimeter duct and run single feeder ducts directly to each register?

A. Such an arrangement is possible, as shown in Fig. 2a. The only difference between this and a conventional forced air system is that the ducts are buried in concrete and located below the floor. Advantages of this arrangement in comparison with the loop arrangements shown in Fig. 1 would be that installation costs would be less, heat loss from the floor slab would be smaller, and air temperatures at the registers would be higher. Disadvantages would be that the problem of cold floor at the edges of the house would not be solved and that unless the ducts are located properly, complaints due to hot floors may arise.

A modification of the individual feeder and loop system is shown in 2b. In this case, individual feeders are used but an additional single loop runs around the perimeter of the house, tying all the registers together. The system resembles a wheel, the central plenum being the hub, the feeder ducts the spokes, and the perimeter duct the tire. The advantage of this arrangement over the double loop shown in Fig. 1 is that the registers are supplied directly by a feeder duct, and the temperature drop of the air in the feeder duct will not be as great as that in the perimeter duct for Fig. 1. Whether any excess air remains to travel through the perimeter duct will depend to a large extent upon the requirements at each register in the system. Under some conditions in which the registers are supplied with the required amount of air from the feeder ducts, it would be possible to have very little flow of air in the perimeter duct. Design tables presented earlier for the perimeter system could be used for the design of this wheel-and-spoke arrangement, and it is probable that the values would be on the conservative side.

Other Variations

Still another modification of the wheel-and-spoke arrangement is that in which the number of feeder ducts is reduced from that shown in 2b, and one feeder duct may supply two registers. Essentially this is similar to the perimeter duct systems shown in Fig. 1, except that the feeder ducts are not run side by side, but outwards as shown in 2c. Of the three modifications shown in Fig. 2, arrangement c retains the essential features of providing warm floors at the edge, some amount of panel heating, and an attempt to keep the air at the register at a reasonably high temperature. Principle difficulty with the arrangement is in developing any sort of rational design procedure. However, the authors believe that the design tables presented previously are applicable.

Q. 3. *Pipe Size.* Could not pipe sizes other than 8 in. diameter be used, particularly for small heat losses?

A. They could be used, but for the purpose of standardization, one pipe size is preferable to two or three. The choice of 8 in. diameter pipe involved a compromise of the following three factors:

a. permissible friction loss in ducts,

b. permissible temperature drop of air in duct, and

c. cost and ease of installation.

Of the three items, friction loss was the most critical, as can be shown from the following example: For the limiting case of a house having a design heat loss of 60,000 Btu per hour, the maximum capacity of the loop is 60 per cent of the total, or 36,000 Btu per hour. Assuming that half of this will be handled by air flowing down one half of the loop, then the air quantities will be 750 lb per hour or a volume of about 187 cfm for an air density corresponding to an average temperature of 135 F. Calculated velocities and friction loss for three pipe sizes each carrying 187 cfm will be:

Pipe Diameter, in.	Max. Air Velocity, fpm	Friction Loss for 100 ft of duct, in.
6	950	0.28
7	700	0.13
8	550	0.07

The worst case from the standpoint of friction loss would be that in which two registers are located at the end of the 45 ft distance from the bonnet, and the entire air quantity of 187 cfm is flowing down the 8 in. pipe. The estimated equivalent length of the duct system would amount to about 115 ft (composed of 45 ft of straight pipe, 20 ft for two 90 deg elbows, and 50 ft for two entry conditions, one at the collecting plenum and one at the register box). On this basis, duct loss alone, without register pressure loss would be 0.32 in., 0.15 in., and 0.08 in. of water for 6, 7, and 8 in. pipes respectively. If the register loss for a given free area velocity is considered to be about 0.04 in. of water, total pressure loss on the warm air side of the duct system would be 0.36 in., 0.19 in., and 0.12 in. for 6, 7, and 8 in. pipes respectively. Since the total pressure available with a conventional warm air furnace is approximately 0.20 in. of water for both the warm air and return air systems, it can be seen that 6 in. and 7 in. pipe sizes will give excessive losses under the conditions outlined. It is true that an air velocity of 950 fpm in a 6 in. duct will result in a smaller temperature drop than a velocity of 550 fpm in an 8 in. duct. The difference, however, as far as can be determined from calculations, is not of great consequence. At this stage, the authors are not inclined to specify more than one pipe size. Two parallel feeder ducts, each 8 in. in diameter, can be replaced by a single duct having a diameter of at least 10.5 in., but for the sake of standardization and ease of installation, the two 8 in. feeder ducts have been retained.

Q. 4. *Shape of Perimeter Duct.* Would it be better to use rectangular ducts that are flat and narrow instead of round pipe?

A. Ducts that are approximately rectangular in shape have been used in some field installations. It would be possible to use a duct which is 6 in. deep and 12 in. wide, or even 4 in. deep and 20 in. wide. With rectangular duct construction wooden forms can be used for the sides and bottom of the concrete trenches, and the trench can be covered with a precast concrete top of reinforced construction. An advantage lies in the fact that a removable wooden form could be used over again, and that the metal duct could be eliminated. A disadvantage would be that the cost of construction may be higher than the method using galvanized steel ducts.

From a heating standpoint use of a wider perimeter duct would tend to increase the panel heating effect, which is not of much significance with the round pipe installation. It should be noted, however, that any increase in the panel heating effect tends

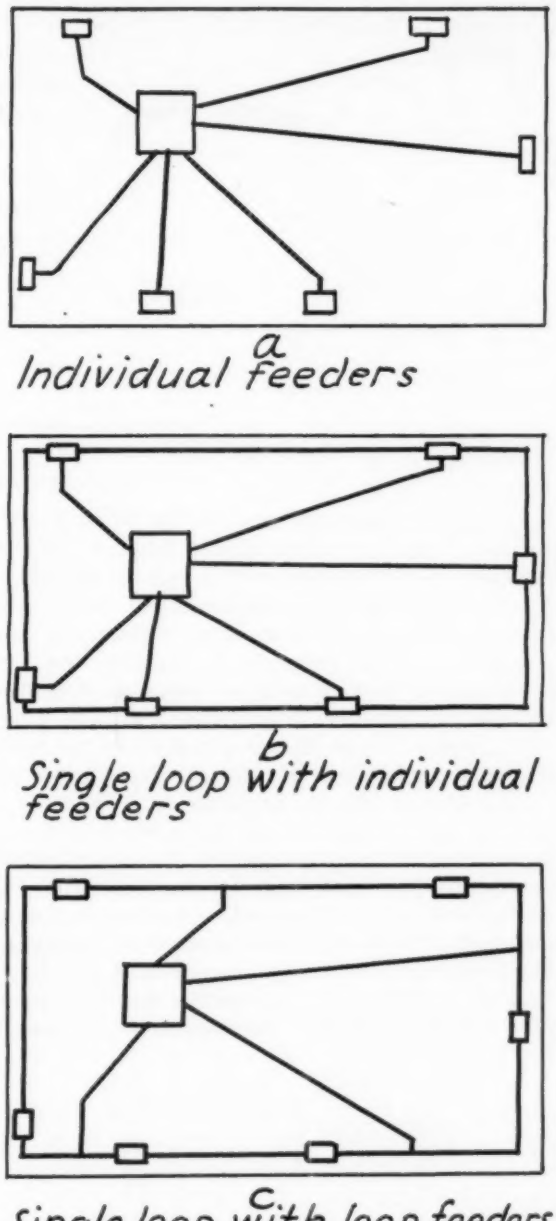


Fig. 2

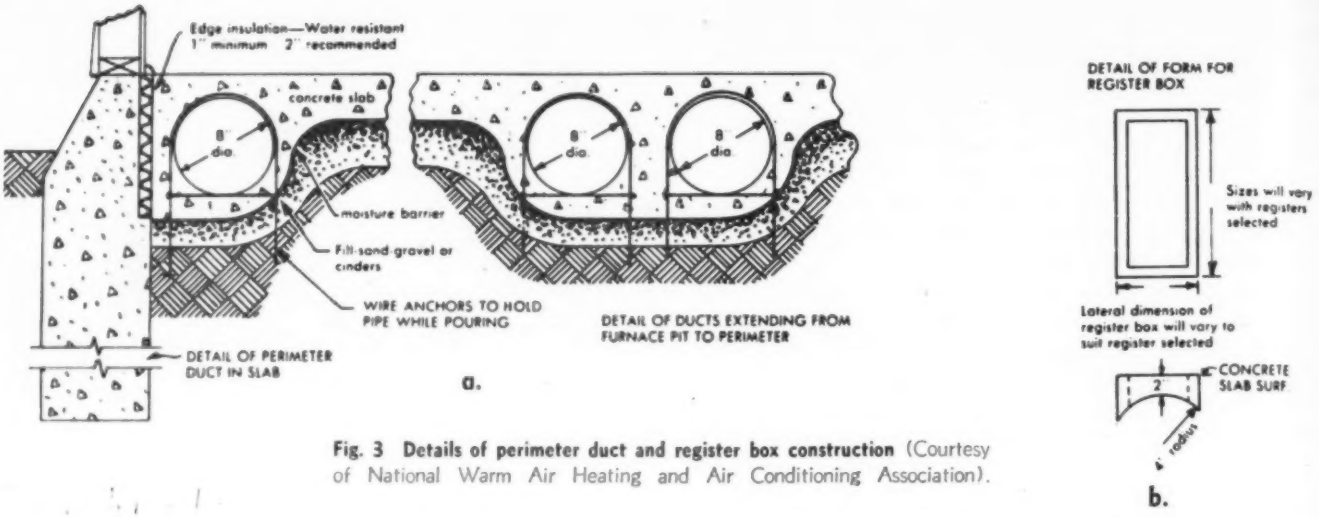

Edge insulation—Water resistant
1" minimum 2" recommended
concrete slab
8" dia
8" dia
8" dia
moisture barrier
Fill-sand gravel or cinders
WIRE ANCHORS TO HOLD PIPE WHILE POURING
DETAIL OF DUCTS EXTENDING FROM FURNACE PIT TO PERIMETER
DETAIL OF PERIMETER DUCT IN SLAB
a.
DETAIL OF FORM FOR REGISTER BOX
Sizes will vary with registers selected
Lateral dimension of register box will vary to suit register selected
CONCRETE SLAB SURF
radius
b.

Fig. 3 Details of perimeter duct and register box construction (Courtesy of National Warm Air Heating and Air Conditioning Association).

to increase temperature drop of the air along the perimeter duct, and rooms distant from the furnace will have to be supplied with a greater amount of air from the warm air registers. For this reason, use of a wide perimeter duct may necessitate greater restrictions on the permissible length of the loop. In the case of a small compact house, no difficulties are foreseen, but in a larger house it may be necessary to run feeder ducts from the furnace out to the far ends of the loop, as illustrated earlier in the wheel-and-hub piping arrangement. Whether a concrete trench will tend to emit a powdery dust as the concrete dries is not known. Certainly the use of a metal duct as a form for the perimeter duct will be better from the standpoint of air and moisture leaks. Under the circumstances no advantage is apparent in using a rectangular concrete trench.

In this connection, the question might be raised as to use of rectangular metal ducts for permanent forms for the perimeter duct. Use of round duct is preferred because it is less likely to be crushed when the concrete is poured. Even with round duct, the installation must be carefully handled to prevent collapse of the metal form.

Q. 5. *Perimeter Duct in Kitchens.* Should perimeter ducts for the kitchen be located behind or in front of the kitchen cabinet?

A. If the perimeter duct is located along the outside wall in a kitchen any panel heating effect will be slight since the cabinets will cover the floor over the perimeter duct. Furthermore, air temperatures inside of the cabinets may become higher than that of the room air, and in some installations this may be objectionable to the homeowner who uses the cabinet space for storage of perishable foods. Present practice seems to favor location of the perimeter duct at the front edge of the cabinet, or slightly in front of it. Result might be a floor temperature

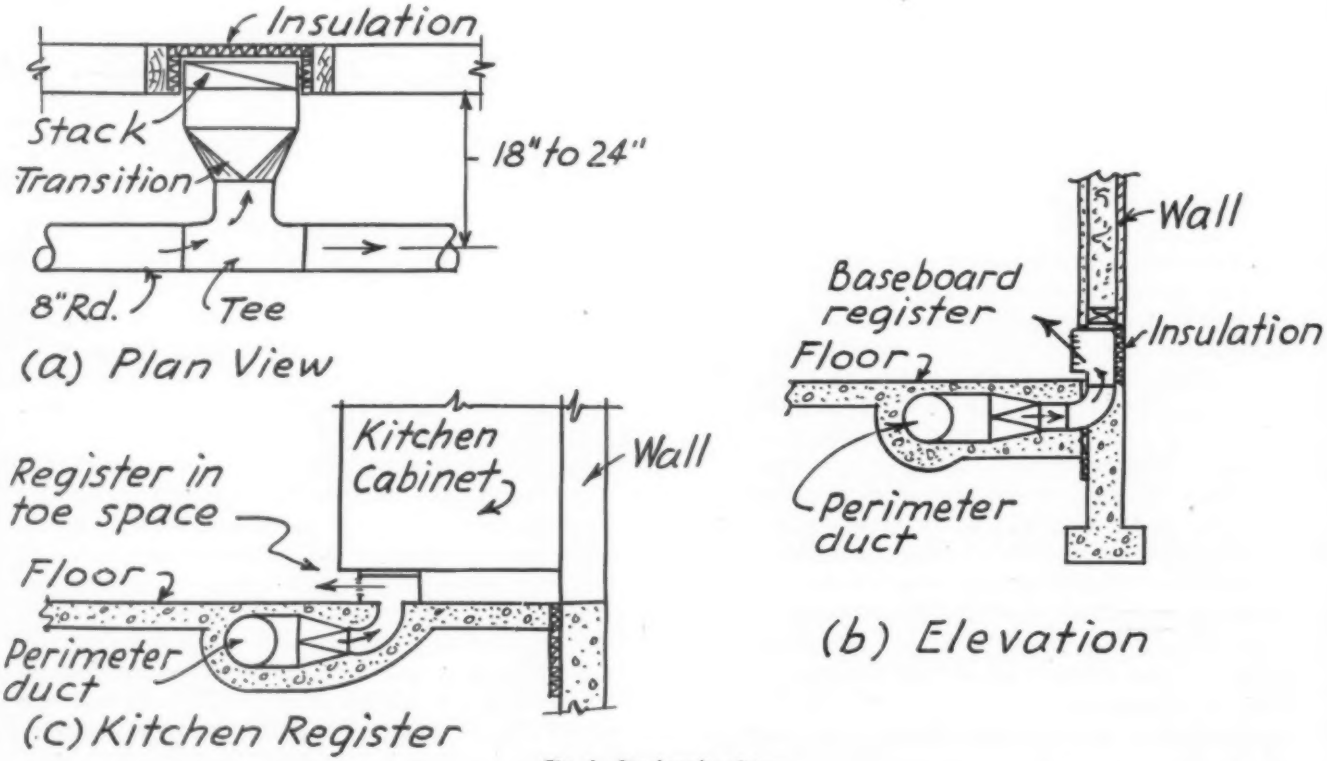


Fig. 4 Baseboard registers.

higher than that considered to be comfortable for long occupancy during periods of extreme cold weather.

Q. 6. *Register-Box Construction.* How is the register box connected to the perimeter duct?

A. Some of the details concerning the construction of the perimeter duct and the register box were supplied by J. Heiman of the International Oil Burner Co. One method of holding the perimeter duct in place when the concrete is poured is shown in Fig. 3a. Wire anchors are driven into the soil about every 3 ft and concrete poured completely around the duct. In Research Residence No. 3, ducts were placed on bricks spaced a few feet apart. Purpose of the anchors is to prevent the perimeter duct from floating to the top of the wet concrete. Some contractors prefer to pour the floor in two installments; the first layer being placed below the perimeter duct, and the remainder after the base layer has hardened.

Register Box Construction

A method of constructing the register box is shown in Fig. 3b. Wooden forms are placed over the perimeter duct before pouring the concrete and securely anchored into place. At this time the opening into the perimeter duct has not been made. A cap can be placed over the register box, or the space within the box can be filled with cinders, in order to prevent the space from being filled with concrete at the time of pouring the floor. Later, after the concrete floor has set, the cap can be removed, an opening made into the perimeter duct, and the sharp edges turned up inside the wooden form. Forms can be left in place to form the frame for the floor register. Use of a metal form, together with a removable cap, should be possible. Some simple device for holding the register box in position should also be feasible.

Q. 7. *Register Types.* What types of registers would be best suited for perimeter warm air heating?

A. It is our belief that the ultimate in register types and locations would consist of a continuous slot discharge around the entire exposed walls of a room. With this ideal arrangement a blanket of warm air would be discharged upwards near the outer exposed wall and would effectively counteract the down currents of cool air from the cold wall and window surfaces. By the same argument, use of multiple registers would be preferable to use of a single register in a room.

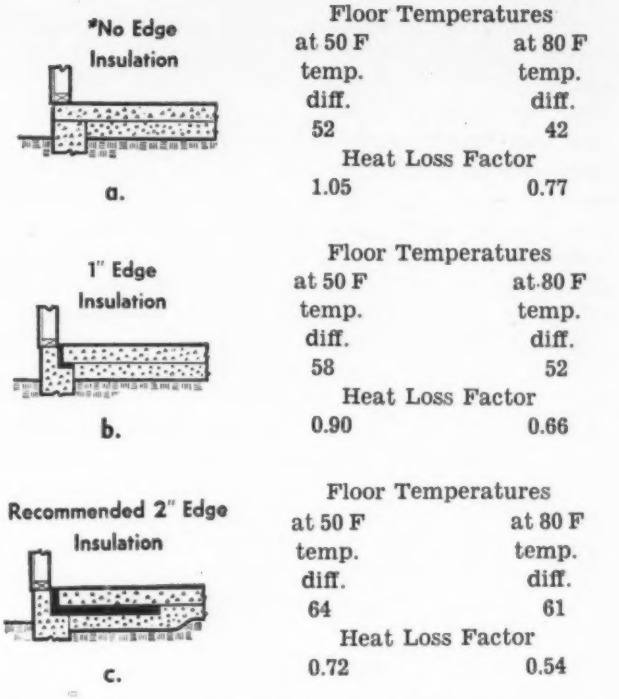
Register design and location is affected by a number of factors and it is reasonable to expect that register manufacturers will be called upon to design floor or baseboard outlets specifically for perimeter warm air heating systems. Floor registers that are 8 in. or 10 in. wide will meet consumer resistance because of the floor space required, and because the presence of the register may make it difficult to locate some items of furniture. Some thought has been given to the possibility of using long and narrow floor registers, 2 by 30 in., for example, which would be located near the baseboard.

Another problem that must be considered is the manner in which air is projected upwards into the room. A vertical projection of air from a floor register located near a cold wall may produce a scrubbing effect of the wall which will ultimately result in dirt streaks. It would seem desirable to provide for a deflection of air about 15 deg from the vertical and away from the wall. If window curtains are used and tied back to the window frame, location of a floor register below the middle of the window may not be objectionable, and in fact might be desirable. On the other hand, with the use of full-length draperies that extend from ceiling to floor line, care must be exercised in locating the register so that air does not blow over the draperies.

Although some heating contractors have given consideration to a baseboard register or baseboard slot openings, the cost of making the connection from the perimeter duct to the register seems to be high. If a baseboard register is to be considered, it would seem desirable to deflect the air upwards about 15 or 20 deg from the vertical plane and away from the wall. Since the temperature of air issuing from the register may be low a downward deflection towards the floor from a baseboard register might cause complaints about drafts.

Q. 8. *Baseboard and Sidewall Registers.* What methods are used to connect baseboard and sidewall registers to the perimeter duct?

A. In view of the fact that floor registers may often prove to be objectionable since they interfere with placement of furniture and serve as dirt traps, some installers prefer baseboard or sidewall registers. This is especially true in bathrooms and kitchens where the available floor space for registers is limited.


*No Edge Insulation
a.
Floor Temperatures at 50 F temp. diff. 52 at 80 F temp. diff. 42
Heat Loss Factor 1.05 0.77
1" Edge Insulation
b.
Floor Temperatures at 50 F temp. diff. 58 at 80 F temp. diff. 52
Heat Loss Factor 0.90 0.66
Recommended 2" Edge Insulation
c.
Floor Temperatures at 50 F temp. diff. 64 at 80 F temp. diff. 61
Heat Loss Factor 0.72 0.54

Note: Floor temperatures were measured on the surface, 6 in. from the exposed edge.

The heat loss factor, F_2, is in terms of Btu per hr. per linear foot of exposed edge, per deg. diff. in temp. from indoor to outdoor.

Fig. 5 Three Types of Floors Tested At University of Illinois By the Small Homes Council.
(Values given are for floors not containing perimeter warm-air ducts).

One method of installing the perimeter duct and fittings to connect to a wall stack is shown in diagram in Figs. 4a and 4b. The perimeter duct is installed about 18 to 24 in. away from the foundation wall, which has the advantage of reducing the edge loss from the slab floor. Before the concrete slab is poured, the 8 in. tee section, and the transition piece between the round pipe and the stack are installed. So is the stackhead, which is provided with a thickness of rigid insulation behind it. The advantage of this construction is that commercially available fittings are used, and no special forms are necessary for the pouring of concrete. As in the case of any wall stack located on a cold wall, care must be taken to insulate the duct thoroughly behind the stack and the register box.

In cases where the warm air register must be placed inside the kitchen cabinet, or in the toe-space of the cabinet, the duct arrangement shown in 4c can be used. Special fittings are necessary above the floor line for such installations.

Balancing

Q. 9. *Balancing of System.* How can the system be balanced?

A. In a perimeter warm air system, as in any other type of central heating system, some provision must be made for balancing the system to maintain desired temperatures in different rooms of the house. In the perimeter system the possible location for a damper in each branch is limited to either the register box or the register face. Dampers should not be installed in the main perimeter duct unless they offer no resistance to the flow of air downstream from the damper. Several possible methods of dampering branch openings have been suggested, but the most feasible scheme seems to consist of a separate set of adjustable louvers, or a squeeze damper below the register face. Another suggestion is the use of an adjustable orifice in the register box immediately below the register. Still another suggestion specifies an adjustable pipe sliding inside the 8 in. perimeter duct, designed to open or close the opening from the perimeter duct to the register box; a sort of slide trombone valve.

No Precise Data

Q. 10. *Edge Loss.* What is the heat loss from the edge of the floor slab to the outdoors?

A. At the present time no data are available for the precise values of edge heat loss. However, for the purpose of setting up the design tables presented earlier, and determining furnace capacity for a given structure, it was necessary to make some approximations of this loss. A study made at the University of Illinois entitled, "Temperature and Heat Loss Characteristics of Concrete Floors Laid on the Ground," by Bareither, Fleming, and Alberty gives data concerning heat losses from concrete floor slabs that do not contain heating elements within the slab. In other words, the only available data are for floors in which the air above the floor is at room temperature, and floor slab temperature is between room air and outside air. To select data from this report and then to extrapolate them to conditions occurring in a perimeter duct system is stretching a point, but under the circumstances is preferable to a wild guess. At any rate, values given in the following discussion are subject to later revision.

Types of Slab Floors

Three of the nine floor slabs tested at the University of Illinois are shown in Fig. 5, and designated as floors a, b, and c. Floor type a is a poor floor from the standpoint of resistance to flow of heat and is not recommended. Floor b shows a 1 in. thickness of edge insulation, and c shows a 2 in. thickness of edge insulation. The latter is recommended for use in perimeter warm air heating systems, but the 1 in. thickness is more commonly used. From these studies of floor slabs, a heat loss factor was derived, in terms of hourly Btu loss for one linear foot of exposed edge and for one deg temperature difference from indoor air to outdoor air. These factors, designated as F_2, are listed in Fig. 5 for temperature differences of 50 and 80 F. It may be noted that the values of F_2 decreased as the indoor-outdoor temperature difference increased. Unfortunately the values shown in Fig. 5 cannot be used directly, since the presence of the perimeter duct places a heat source close to the edge insulation. The only feasible procedure was to consider the temperature difference as that between the temperatures of heated air in the perimeter duct and the outdoor air. An average value of 135 F will be slightly high for the air temperatures that will be obtained in the duct under normal operating conditions. Next step was to estimate the factor F_2 for a temperature difference based upon 135 F air temperature in the duct. This was done from the curve presented in the Illinois report, and values of 0.44 and 0.55 were selected for 2 in. and 1 in. thicknesses of edge insulation. Using these F_2 values the heat loss factors from the edge of the slab floor were estimated as shown in Table 1 (Page 158).

Point of Greatest Loss

Edge heat loss for a floor slab will be greatest at the point where the feeder duct enters the perimeter duct, since air temperatures in the duct are high, and will be lowest at the far end of the perimeter duct. It will not be practical for the heating contractor to attempt to calculate the varying amounts of edge loss around the perimeter of the house. The recommended method is to multiply the factor given in Table 1 by the length of the exposed edge of the entire house. For example, consider a house which is 24 by 32 ft in dimension. Total length of the perimeter is 112 ft. For an outdoor design temperature of -10 F, the edge loss factor is 80 where 1 in. edge insulation is used, and 65 for 2 in. edge insulation. Hence total floor loss will be 112 x 80 or 8960 Btu per hour for the 1 in. edge insulation, and 112 x 65 or 7280 Btu per hour for the 2 in. edge insulation. The value of the floor heat loss is then added to the heat loss for all rooms, as previously determined, to obtain the total heat loss from the structure.

(Please turn to page 158)

Fundamentals Of Calculating Heating And Cooling Loads

PART TWO

JAMES J. LA SALVIA
Cleveland, Ohio

Figuring the heating and cooling loads for an air conditioning system calls for knowledge of certain specific information and conditions. These conditions and the background behind their use are discussed by the author in this article.

PROPER design of a heating system requires calculation of the maximum heat loss of the structure, based on specific inside and outside conditions for the locality. Each room or space to be heated should be calculated separately.

Heat losses are divided into two types:

1. Transmission heat losses through walls, glass, floors, ceilings, and roofs.
2. Infiltration heat losses due to air leakage around doors and windows and through cracks and crevices.

In order to calculate heat losses certain specific information and assumptions must be known. These are as follows:

1. Inside conditions
2. Outside conditions
3. Attic temperatures
4. Ground temperatures
5. Basement temperatures
6. Unheated spaces
7. Infiltration heat losses
8. Transmission heat losses

Inside Conditions

Maintaining a comfortable temperature is dependent on relative humidity and air motion. The usual inside design conditions calculated for residences are 70 F and 30 per cent relative humidity. This, according to the comfort chart, is a 65 F effective temperature. It is essential to maintain 30 per cent relative humidity under such conditions. If the humidity is not to be considered, it is necessary to raise the design temperature to 76 F otherwise the interior of the house would be too cold at extreme outside temperatures. Inside design conditions are virtually the same throughout the country. Most localities have fixed standard inside design conditions which are satisfactory for their areas and should be considered. When the basement is to be heated, it should be designed for 70 F.

The relative humidity of 30 per cent at 70 F temperature denotes the amount of moisture in the occupied space. In other words, the amount of moisture entrained in the air for this particular condition, is 30 per cent of the moisture that 70 F air would hold when fully saturated. For instance, when air at 70 F is saturated, the air will hold the maximum amount of moisture or 8.1 grains per cubic foot. And 30 per cent of 8.1 grains is 2.5 grains per cubic foot.

Thus, when calculating inside design conditions of 70 F temperature and 30 per cent relative humidity each cubic foot of air in the space is to have 2.5 grains of moisture per cubic foot.

Outside Conditions

Most localities have set up standard outside conditions to be used for designing heating systems. In determining such conditions the lowest temperature recorded is not used, nor is the lowest daily mean temperature used. Correct outside design temperature is found by averaging the lowest temperature recorded and the lowest daily mean temperature and adding 10 deg. The result is the outside design temperature.

For instance, consider three cities, New Orleans, Cleveland and Minneapolis.

Recorded	New Orleans	Cleveland	Minneapolis
Lowest outside temperature	7	—17	—34
Lowest mean daily temperature	26	—2	—23
Average temperature	16.5	—9.5	—28.5
	+10.0	+10.0	+10.0
	26.5	.5	—18.5

Therefore, the outside design temperatures for the three cities are:

New Orleans	25 F
Cleveland	0 F
Minneapolis	—20 F

The same procedure can be used in any locality to

determine the outside design temperature.

Relative humidity, in each case, should be assumed as 100 per cent. For each city the grains of moisture in the outside air would be as follows:

New Orleans	1.6 grains per cu ft
Cleveland	.5 grains per cu ft
Minneapolis	0.0 grains per cu ft

Then the complete outside design conditions for the three cities are:

New Orleans	25 F & 1.6 grains per cu ft
Cleveland	0 F & .5 grains per cu ft
Minneapolis	—20 F & 0.0 grains per cu ft

Attic Temperatures

The best method of determining the heat loss through attic spaces which are not heated, begins by determining the attic temperature. After the attic temperature has been ascertained, then it becomes an easy matter to find the transmission heat loss through the ceiling. In the winter time the attic space is tight and ordinarily has no recirculation. Under these conditions a simple method is used for arriving at the attic temperature. This method is as follows: Add the outside and inside design temperatures and divide by two, the answer is the temperature in the attic space.

	New Orleans	Cleveland	Minneapolis
Outside design temperature	25	0	—20
Inside design temperature	70	70	70
	95	70	50
Divide by 2, Attic temperatures	47.5	35	25

Then the attic temperatures to be used in these three cities are:

New Orleans	50 F
Cleveland	35 F
Minneapolis	25 F

Ground Temperatures

Ground temperatures will vary considerably in different sections of the country. Above 40 deg. latitude in this country, frost will penetrate 4 ft in the ground. And considering that basements are usually 7 ft high, frost would travel half way down if the basement was entirely below grade. When basement walls and windows are above grade or the windows are in areaways, such space should be considered as directly exposed to outside temperatures.

Temperatures under basement floors are influenced by the heat from the basement. For heat losses through basement floors, the ground temperature can be assumed as 60 F above outside design temperature.

When the first floor of house is directly upon ground assume ground temperature as 40 deg above outside design conditions.

For garage floors on ground assume the ground temperature as 40 F above the outside design temperature.

Basement Temperatures

When a specified temperature is to be maintained in the basement, heat loss should be estimated in the usual manner, based on the proper wall and floor coefficients and the outside air and ground temperatures.

Heat loss through basement windows and that portion of basement wall above grade should be based on outside temperatures and the proper air-to-air coefficients.

With basement walls 5 ft or less below grade, heat loss should be figured using the adjacent ground temperature as 15 F above outside design temperature.

With basement walls entirely below grade, heat loss should be calculated using the adjacent ground temperature as 30 F above design outside design temperature.

When the basement is not heated and is entirely below grade, with no windows, the temperature in the basement can be assumed as 60 F above outside design temperature.

When the basement is not heated and the basement floor is 5 ft or less below grade, with windows, the temperature in the basement can be assumed as 50 F above outside design temperature.

Unheated Spaces

It is rather difficult to devise a rule as to what temperatures should be assumed in unheated spaces. The following assumptions have proven very successful:

a. When an unheated space between first floor and ground is not tightly closed, assume that the temperature in the space is the same as outside design temperature.
b. When an unheated space between first floor and ground is tightly closed with wood siding, assume space temperature as 20 F above outside design temperatures.
c. When an unheated space between first floor and ground is tightly closed with at least 8 in. of masonry, assume ground temperature as 30 F above outside design temperature.

Many times an unheated space is within the residence and in such cases assume the following temperatures:

d. When the amount of wall plus glass of unheated space is the same as the adjacent heated wall area, assume the temperature of the unheated space as the average between the inside and outside design temperatures.
e. When the amount of glass in unheated space is 50 per cent or greater than the adjacent heated wall area, assume the temperature of the unheated space the same as the outside design temperature.

Infiltration Heat Loss

Infiltration heat loss is one factor which is greatly misapplied. Infiltration or air leakage into a space occurs at all times when the outside wind velocities are above 2 miles per hour. The greater the wind velocities, the greater will be the infiltration. This infiltration is from the outside to the inside and it comes in through cracks around windows, doors and cracks through the structure itself. Therefore, heat must be provided to offset this infiltration and is known as the infiltration heat loss. Infiltration heat loss is made up of sensible and latent heat losses.

The function of the sensible heat loss is to:

a. Warm the outside air entering the space from the outside design temperature to the inside design temperature.

The formula used to arrive at this heat loss is:

$$H_s = \text{cfh} \times .24 \times .075 \times (t_i - t_o) \quad (5)$$

Where,

H_s = Sensible heat loss in Btu per hour.
cfh = Cu ft of air leakage per hour.
.24 = Specific heat of air.
.075 = Weight of one cu ft of air.
t_i = Inside design temperature.
t_o = Outside design temperature.

Example: Infiltration is given as 3,360 cu ft per hour, inside design temperature is 70 F, and the outside design temperature is 0 F. What is the sensible heat loss due to infiltration?

$H_s = 3360 \times .24 \times .075 \times (70 - 0)$

$H_s = 4233$ Btu per hour

The function of latent heat loss is to:

b. Evaporate the required amount of water for the humidity to be carried in the space.

When humidity is controlled in a space, it is necessary to add moisture to the air leaking into the room, in order to maintain the proper amount of humidity. This is so, because the entering air at low outside temperature has less moisture than called for in the space. In order to meet this condition, it is necessary to determine the heat equivalent to evaporate the required amount of water. This loss is known as the *latent heat loss* and is determined by the following formula:

$$H_L = \text{cfh} \times (G_i - G_o) \times \frac{1080}{7000} \quad (6)$$

Where:

H_L = Latent heat loss, Btu per hour
cfh = Cu ft of air leakage per hour
G_i = Grains of moisture in 1 cu ft of air at inside design temp.
G_o = Grains of moisture in 1 cu ft of air at outside design temp.
1080 = Latent heat of water vapor in Btu per pound of water
7000 = Grains in one pound of water.

Example: Given the infiltration as 3360 cu ft per hour and the inside design is 70 F temperature and 30 per cent relative humidity and each cu ft of air has 2.5 grains of moisture. The outside design conditions are 0 F temperature and 100 per cent relative humidity and each cu ft of air has .5 grains of moisture. What is the latent heat loss due to infiltration?

$$H_L = 3360 \times (2.5 - .5) \times \frac{1080}{7000}$$

$H_L = 1037$ Btu per hour

Method of Determining Infiltration

There are many methods employed in the industry for determining the amount of air infiltration. The most common are:

1. Crack method
2. Air change method

Using any method an exact estimate of the amount of infiltration is difficult to make. There are many factors involved and the most important are:

a. Variation in building construction.
b. Variation in wind velocities and direction.
c. Ventilation.

Tight construction throughout the building is the only means of restricting infiltration to a minimum.

The crack method depends largely on the building construction for its accuracy. At the design stage, assumptions are made for certain widths of cracks and clearances for various types of windows and doors, etc. But these clearances are very seldom maintained when the building is completed. There are many types of windows and clearances for each type vary a great deal. If the specified cracks and clearances are maintained, the crack method is best for determining the amount of infiltration. For general buildings this method is recommended.

The easiest method to use for residences is the air change method. This is based on a standard wind velocity of 15 miles per hour. The wind velocity can vary almost 50 per cent either way with no appreciable effect on inside conditions. Basis of this method is the number of air changes caused by the infiltration due to the number of sides of a space exposed to the outside. Such as:

Rooms with one side exposed — use 1 air change per hour.
Rooms with two sides exposed — use 1½ air changes per hour.
Rooms with three sides exposed— use 2 air changes per hour.
Room with four sides exposed — use 2 air changes per hour.

When storm windows and weather stripping are used cut the air changes to one-half the above.

Example: Given a room 20 ft long, 14 ft wide and 8 ft high, with two sides exposed, with no storm windows. What is the amount of infiltration in cubic feet per hour?

20′ x 14′ x 8′ x 1.5 air changes = 3360 cu ft

In this case the infiltration is 3360 cu ft per hour.

If storm windows were used the above figure would be one half less or 1680 cu ft per hour. This infiltration has to be determined for each room.

Ventilation

While tight construction is the objective of the builder, the dwelling must not be made so tight as to eliminate infiltration entirely. A certain amount of infiltration is beneficial as it provides ventilation, which is necessary for the well being of the occupants. Ventilation may be defined as: "the process of supplying or removing a proper quantity of air from a given space by natural or mechanical means."

Each person requires approximately 34 pounds of air per hour, or 460 cu ft. Ventilation is also required in removing body, cooking and tobacco odors. It is apparent then, that infiltration or ventilation must be provided with each heating or cooling system.

Infiltration is the term applied when outside air enters the space through cracks and clearances.

Ventilation is the term applied when outside air enters the furnace or air conditioner and is then supplied, together with recirculated air, to the occupied space. The amount of outside air, or ventilation, may be the same or greater than the determined infiltration. Infiltration is then omitted. With this method the cracks and clearances are used to discharge the

(Please turn to page 160)

Seven Short Steps to C-A-C Adjustment

A bulletin giving a simplified explanation of the method of adjusting a heating system for Continuous Air Circulation has been issued by the National Warm Air Heating and Air Conditioning Association. All the necessary information is contained in the procedure given below.

The following instructions apply to systems where the blower is controlled by a fan switch located in the furnace casing or warm air plenum. This proposal is not intended to cover special equipment and applications or subsequent developments.

PROCEDURE	REASON
Check thermostat location to see if it is affected by heat sources other than room temperature. If it is—correct cause of trouble by changing location if necessary.	Direct flow of warm air from a register, sun's rays, hot water pipes, warm air stacks, radio and light bulbs are often responsible for improper operation of thermostat.
Adjust thermostat to its closest practicable differential setting. If close setting of differential is not possible, recommend replacement.	Close differential will result in more frequent cycle of the source of heat, thus providing more even air temperatures.
See that warm air registers and return air faces are open. If system has been balanced, leave dampers set, for present.	Obstructed supply and return will impair proper functioning of system.
Check filters. Filters should be reasonably clean. If not, replace before proceeding with adjustment.	It is impossible to obtain proper adjustment of the system with dirty filters in the unit.
Adjust blower speed and controls. Slow down blower speed by opening adjustable pulley on motor. Air volume need be only sufficient to adequately supply run having most resistance. High register velocity is not desirable nor necessary with continuous air circulation. Set blower control cut in *as low* as practicable, usually from 100 F to 110 F for high side wall registers and 110 F to 120 F for low wall registers. Set blower control cut out at minimum differential, approximately 15 deg lower than cut in.	Blower speed is usually too high. This causes air blasts from registers and short on periods of blower operation. Both of these are principal causes of discomfort. Just the volume of air should be circulated, when blower operates continuously, that is required to heat the house when the outside temperature is at design conditions. Lower cut in temperature and minimum differential results in long on periods of blower operation. This is the most essential factor in preventing stratification of room air—with the cold strata in living zone.
Set limit control cut out at 175 F. If limit control cannot be set independently of blower control, recommend new instrument.	This low setting of the limit control will have the effect of adjusting the input to the house requirements preventing overruns in cases where the equipment is over-sized or the input too great. Only in rare cases will a higher setting be required.
Adjust registers so that air is properly deflected and air stream does not discharge directly into space that will normally be occupied by people at rest.	The use of adjustable, deflecting type of register controls the direction of the air stream and rapidly reduces the air velocity. Where registers of proper type cannot be substituted for critical locations, it is sometimes found necessary to make special diffusers or shields to fit over older types.
Adjust dampers to properly balance system for the revised air delivery. Set thermostat to produce comfort zone for occupants. This is usually between 70 and 75 F. Changes in setting, up or down, should be made 1 deg at a time until satisfactory.	Proper setting of dampers for correct distribution is usually simplified by C-A-C because long branches do not load up with cool air due to long off periods of blower.

Typical house heated by Ruxton.

Planning Cuts Heating Installation Costs

R. C. NASON, Great Neck, Long Island

PLANNING every possible detail of business operation is one of the basic principles followed by the Ruxton Sheet Metal & Air Conditioning Company, Garden City, New York. Residential work makes up the bulk of volume for this contractor and it has been observed that this meticulous attention to detail is rewarded with a much closer control of costs and sometimes is the difference between profit and loss.

Originally, Ruxton was a roofing and siding business, also handling insulation. After a heating division was added the volume in this new field grew so rapidly that a new shop, called plant No. 1, was soon necessary.

As with all heating businesses there are three phases of operation: 1, selling; 2, shop fabrication; 3, installation; and Ruxton has always attempted to coordinate these activities as closely as possible. A heating survey is required of every prospective installation and the engineering department draws up specifications and heating layouts along with the written proposals. The salesmen are then able to present an attractive proposal to the potential customer and are not forced to quote figures from the back of an envelope.

Heating Plant Guaranteed

An attention-getting factor in the proposals drawn up by this company is the guarantee to heat the house to 70 F when it is 0 F outside. This guarantee is not without qualification, since it states, "provided the system is operated with care and in accordance with operating instructions."

Also included on the heating layout offered to the prospect is the information that, "Btu heat loss (is) computed by methods and data recommended by the American Society of Heating & Ventilating Engineers Guide." The heat loss and cfm supplied to each room are charted on the drawing, as well as a description of the heating unit including: capacity, model number, manufacturer and fuel requirement. All such drawings are signed by the heating engineer and the draftsman, and are dated and numbered. By making clear statements about what performance can be expected from the heating plant, the company protects itself against any complaints which might be due to misunderstanding.

Many of the contracts obtained by this contractor are for groups of houses in a real estate development. Some jobs have included 50 houses or less while some have called for more than 200 installations. Most of these residences are of 1½ story design and cost less than $15,000. The attics are unfinished and a garage is not included with the house. However, the company has not restricted its business to this particular type or

Ruxton's heating shop.

Riser to the unfinished attic is shown. When the attic is completed heat can be brought up very easily and quickly.

price of house but has installed heating plants in $50,000 homes, too.

When an order is received, a contract number is given to each individual unit and that number is used to identify the job through the process of installation until permanent filing after completion.

Operation of the shop and equipment follows the principles of practical planning which are used in other phases of the business. Sheet stock is stored near the shear so that there will be no waste motion involved in starting the raw material through the production process. Adjoining the shear is the layout table; in fact, one of the supports for the shear is set in the table.

Fitting Production Setup

Shear lines are indicated by the layout man and the sheet then passed over to the shear operator. After shearing, the blanks are moved to the other end of the shop where another layout man marks lines for the nibbler and brake. Next the work goes to flangers, crimpers and other small machines and then to a lockforming machine. Air hammers are used to close the Pittsburgh locks. When the work has reached this stage of production it is near the shipping department and individual pieces of an order are marked with the job number and assembled job by job.

An example of the initiative displayed by this firm is to be found in the presence of galvanized steel filing cabinets and office furniture. Since this equipment was required at a time when it was commercially unavailable, the shop proceeded to make its own cabinets from 16 gauge sheet steel.

Several low cabinets were made which use trays instead of drawers. One is located near the shop foreman's desk and another near one of the layout tables. These cabinets contain manufacturer's catalogs and job papers on current contracts. A file cabinet holds shop sketches and tracings, job data that might be on separate paper sheets and recently completed jobs filed by owners' names. Dividers and tabs classify the

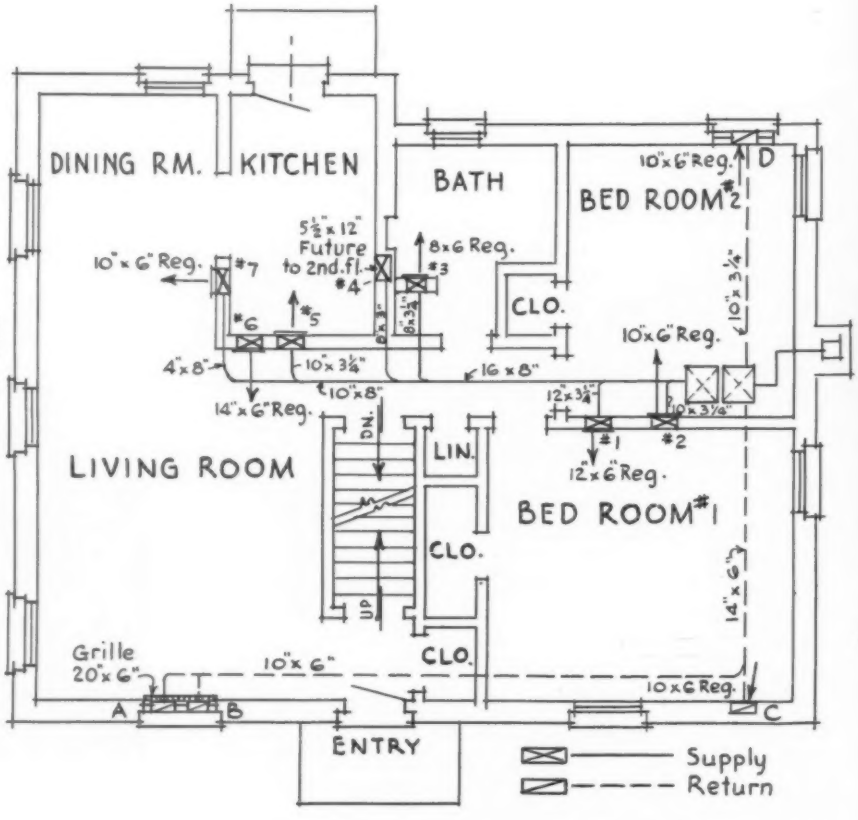
(Please turn to page 162)

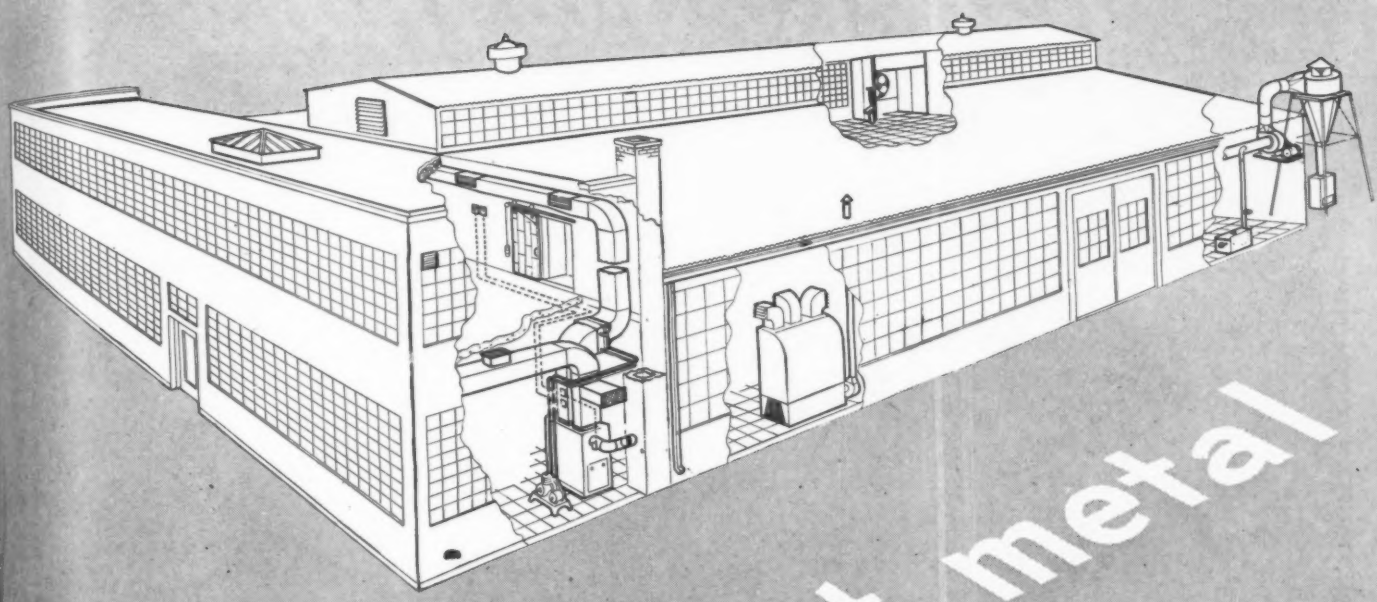
Every purchaser of a home heated by this contractor receives a heating layout like the one at the right. The guarantee is also contained on this blueprint.

Heating Schedule
Registers & grilles; low wall

Room	Btuh-loss	cfm	Supply	Return
Bedroom 1	7,220	95	#2	C
Bedroom 2	5,776	76	#2	D
Bath	2,888	38	#3	O
Future 2nd floor	12,996	171	#4	O
Kitchen	2,888	38	#5	O
Living room	12,084	159	#6	A(10") B(8")
Dining room	5,776	76	#7	0
Totals	49,628	653	7	4

Ceilings insulated with 2 in. batts and doors weatherstripped.





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Save Time and Money When Flashing Masonry Walls

JOHN F. GOWEN
Engineer Consultant
Copper & Brass Research Association

Every branch of the construction industry has been making all-out efforts to lower building costs so that the present high volume of construction may be maintained. Mr. Gowen points out in this article some practices which cause needless labor expense. Thorough planning by the architect or builder will eliminate these extra charges.

MUCH thought and research are being devoted to development of building products which will cost less and take less field labor to apply. Recognizing this fact and taking into consideration today's high construction costs, it is a strange sight to see mechanics laboriously raking out brick joints, or painstakingly cutting out a slot in the masonry walls or chimney of a new building in order to set the cap flashing strips. This is difficult to understand because it is slow and inefficient and moreover is a waste of time and money to erect work which must immediately be altered or torn apart. Such a procedure need not be followed, however. Let us analyze why it comes about.

It appears that such second-guessing is due to two factors: plans which do not clearly indicate where there must be watertight joints; and poor organization by the builder who has not only failed to anticipate flashing needs but also to have the various building trades work together for maximum speed and economy.

Builders Want Good Results

Probably the latter cause is responsible in 95 out of 100 instances, for any competent builder expects, as a matter of course, to construct a tight structure, and plans to do this in such a way as to make a profit and enhance his reputation for good work. There are some who are inclined to make their profit on extras resulting from poor plans and specifications, but fortunately these are few. Generally it is careless planning, particularly on custom-built single houses; though recently there was an instance of a 1000 unit housing project where over a mile of slot had to be cut in new brick walls because of lack of attention to such detail. There is no need for such expensive repeat operations, if a few common-sense precautions are taken before the job is started, by architect, estimator and builder.

The architect can make sure of watertight joints by: indicating on his drawings that built-in cap flashings are to be used at all intersections of roof planes and vertical surfaces; and by inserting in his specifications paragraphs such as:

> *Flashings—Where Required*
> All intersections of roofs with vertical surfaces of every kind, and all openings in roof and wall surfaces, shall be flashed with copper. In addition flashings shall be installed wherever shown on the plans. The method of flashing, except as otherwise shown or specified, shall be base and counter, or cap flashing, the latter to be built in as the masonry is erected.
>
> *Flashings. (Mason's Specifications)*
> Where shown on the plans, or specified herein or elsewhere required by the architect, this contractor shall do all the work necessary to install copper flashing pieces provided by the sheet metal contractor, and as directed by him, as integral parts of the masonry walls.

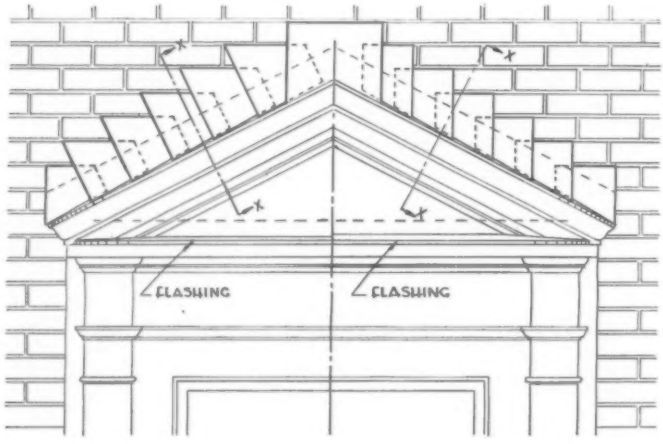
When preparing bids the builder should secure from the architect a clear definition where there is the least doubt about methods and extent of flashings. It is likewise important to call the attention of the estimators for the mason, carpenter and sheet metal trades to the flashing requirements.

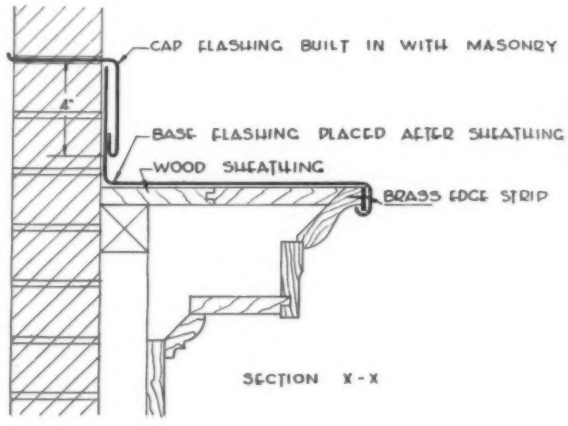
After construction has started the builder must make sure of full job-cooperation, viz.: that the carpenter locates the exact line of the roof sheathing and promptly supplies to the mason all nailing strips, blocking, etc.; that the mason gives the sheet metal

contractor exact dimensions for cutting and forming the cap flashings; and that the sheet metal man has the flashing pieces on the job in plenty of time for the mason to set them in his work without any loss of time.

An Efficient Project

A typical example of good job-planning is the great Fairlington Housing Project, built in 1942-44 in Arlington, Virginia. It contains 5,000 dwelling units, all built of brick and stone veneer. There are more than 6,000 wooden entrance canopies and porches, and about 2,000 ventilator chimneys that required built-in cap flashings. Bills of material and time schedules were prepared and a sheet metal shop was set up on the site. In the shop 14,000 pieces of copper cap flashing were formed and stored, ready for delivery anywhere on the two-mile long project as the masonry work required. A similar systematic approach will pay dividends in time and money as well on one house as on 5,000.





FLASHINGS AT DOORHEADS & CANOPIES FIG. 1

The quick and inexpensive manner developed for forming and setting these cap flashing pieces is illustrated in Fig. 1 and 2. Because the brick work was placed before the roofing (and to allow for expansion and contraction) the conventional two-piece flashing consisting of cap and base was used. The cap piece was built in as the brick work progressed, with each sheet lapping over the next lower one at least 3 in. The lower edge was turned back ½ in. for stiffness, and the sheet was cut to lap the base flashing piece at least 4 in., but not placed until the roof sheathing had been set. Section X-X, Fig. 1, shows how this was done. The cap piece was secured in the masonry back of the brick course (note that the detail indicates how to secure the metal in a solid brick wall). Over doorways a through-wall flashing piece is usually set just above the brick course where the topmost flashing piece enters the wall.

Flashing a Chimney

The standard method of flashing a chimney is to extend the cap flashing into the wall and turn it up back of the first brick course, as indicated in Fig. 2. Ordinarily, this method will prevent leakage. Much more positive and little more expensive, is the practice of carrying the flashing through the masonry to the flue lining, carrying it through to the inside of the flue and turning it up. Thus, any water driving deep into the chimney wall will not work its way down and appear as wet spots on the ceilings. This method will cost less than raking out mortar joints and inserting flashing pieces. The amount of labor saved, both working and stand-by time, more than offsets the cost of the additional metal needed for such a complete cut-off.

But there are cases where standing masonry has to be cut. Such an instance is the joining of a new wall to a lower existing wall where the line of juncture must be made watertight lest ice-pressure force the masonry out of line. Here a joint must be raked out, if the masonry is brick, as in Fig. 3; or a reglet (slot) cut in monolithic, concrete masonry, as shown in Fig. 4.

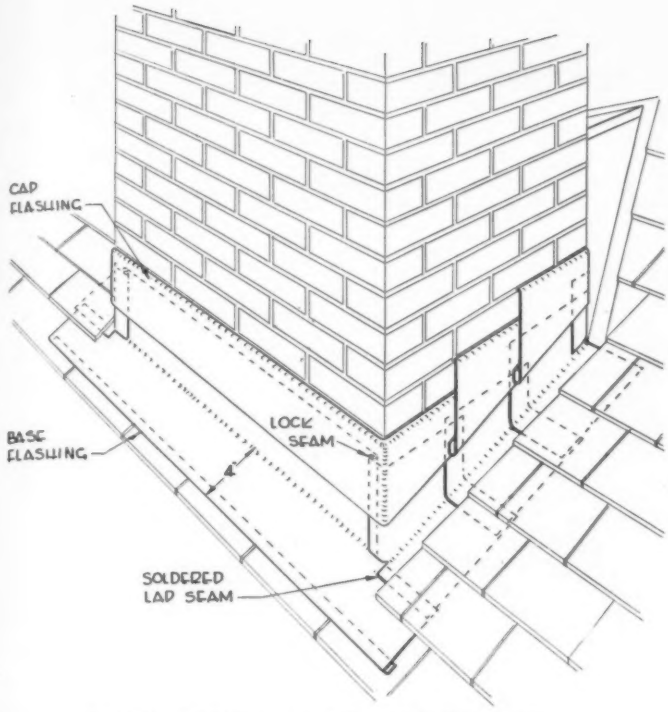
In new concrete masonry walls when the cap flashing pieces cannot be set before the concrete is poured, the least expensive way of providing a fastening is the stock-type metal reglet shown in Fig. 4. This is fastened to the form with double-headed nails, and when the form is filled a machine-made reglet of proper shape is cast into the concrete.

Fastening Flashing Strips

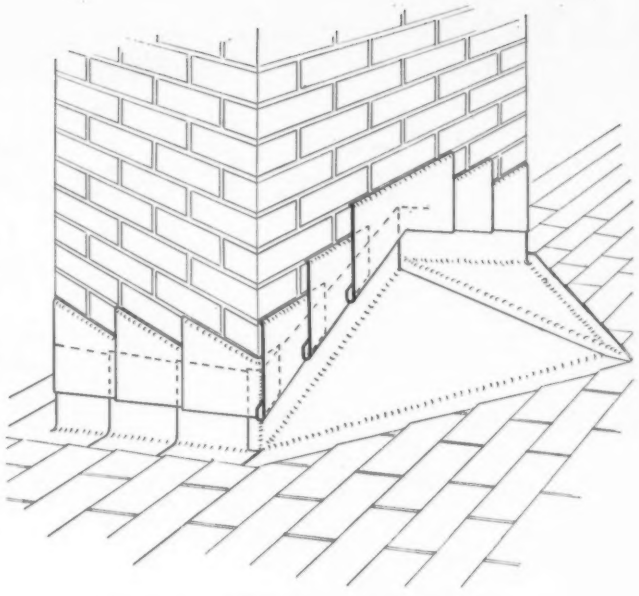
The flashing strips are fastened into such grooves by lead wool wedged into place. This lead caulking need not be continuous, nor need it be packed in flush with the surface. A less expensive way that will give satisfactory results is to drive in lead plugs at intervals of about 12 in. and to fill the intervening space with an elastic cement compound colored to match the masonry.

In England it is standard practice and real economy to use, instead of lead plugs, small bits of copper trimmings folded into wedges and hammered in until they spread out and take hold. The reglet is then caulked with mortar or caulking compound.

No matter what caulking method or material is used the copper sheet must be inserted all the way into the reglet, and must have the ¼ by ⅝ in. hook shown in Fig. 4. This is a small but very important detail



CONTINUOUS CAP FLASHING AT BASE



STEPPED CAP FLASHING

FIG. 2

if the cap flashing is to remain for any length of time.

Rather than rake joints or cut reglets it will often cost less and is accepted practice to drill holes about 12 in. apart for lead expansion sleeves, or inserts, into which brass screws can be threaded. This detail is shown in Fig. 5. The copper cap soldered over the screwhead need not be used except where there is a likelihood that the small amount of water that works its way through the screw slot in the flashing piece will cause damage. Obviously the dished caps make the screwholes tight.

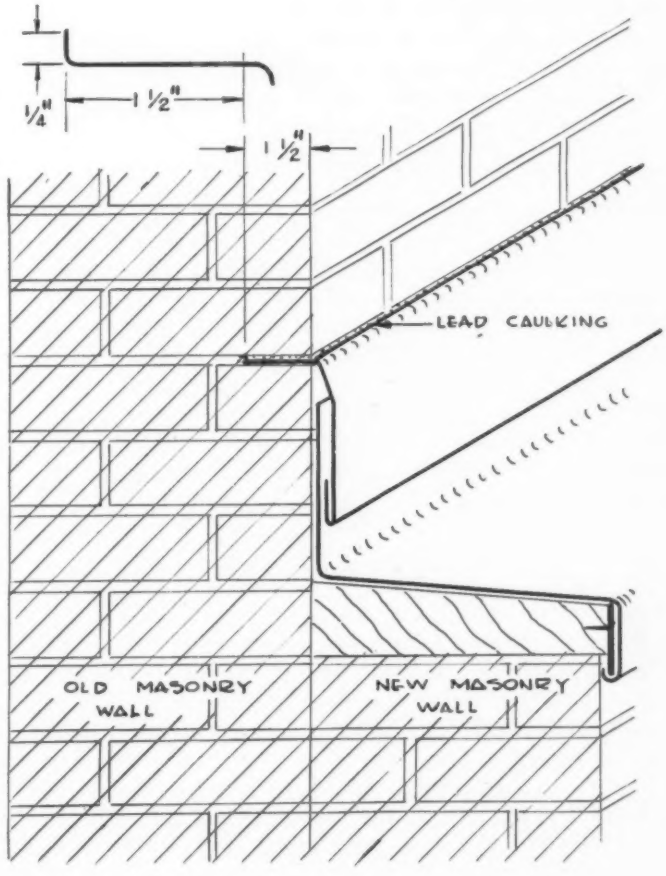
There is no cheap way to do a good, tight, durable flashing job. But there is no excuse for failing to arrange the various steps in building to keep costs at a minimum. *Work is never done twice on any well-organized job.*

The drawings which accompany this article and illustrate proven methods of doing first-class work at reasonable costs are adapted from the standard details of "Modern Applications of Sheet Copper in Building Construction" recently published by the Copper & Brass Research Association. To further emphasize the ultimate economy of good work and good materials, here are some statements from this volume.

"Roofs and walls of buildings have many weak points that must be safeguarded against leaks. In the main these occur at the joints between the plane surfaces, vertical, horizontal and sloping, that form the exterior of a structure. Obviously all must be watertight.

The sole purpose of the whole roofing, flashing, and drainage system is to shed water and carry it away from the building quickly and efficiently. Valleys and gutters are not basins or reservoirs, but channels to lead water away. Wall flashings

(Please turn to page 104)



RAKED MASONRY JOINT CAULKED WITH LEAD WOOL

FIG. 3

Pattern Development for

Five Piece 90 Deg Elbow

HUGH B. REID
Detroit, Michigan

THE purpose of the simplified drawing is to bring out the simplicity of pattern development as applied to sheet metal work. This method is representative of most round elbow pattern developments, differing only in size and number of pieces.

A full elbow is generally considered to be one that turns a right angle or 90 deg. In making elbows that are less than 90 deg, the general practice is to specify the number of pieces of a 90 deg elbow pattern required to make the lesser angle.

Single Pattern, Many Elbows

It can be readily seen from the drawing that a number of elbows, varying in degrees of bend can be made from the same pattern, those include elbows with a turning, angle of: 22½ deg, 45 deg, 67½ deg and 90 deg. A 67½ deg elbow would require four pieces of the five piece elbow pattern. A 45 deg would require three pieces of a five piece elbow pattern and the 22½ deg would be two half gores of a five piece elbow pattern. This practice will enable the shop to set up a standard of fabrication, which will eliminate much costly layout work.

Half Gores Are Needed

Keep in mind that two pieces of any elbow must be *half gores* and that those will always be on the ends. The half gores on the ends square the turning of the elbow with the center line, thus making it possible to connect the elbow to a straight section of round pipe. The experienced sheet metal worker will be familiar with the preceding facts, but it is worth calling attention to for those who are seeking more information regarding general trade practice.

If sufficient interest is shown, a supplementary sheet will be presented showing the adopted standard for round elbows. Included will be the various degree of elbows that can be constructed from patterns developed for five, seven and nine piece 90 deg elbows.

Following is a step by step explanation for the pattern development of a five piece 90 deg elbow.

First Step:

Make the drawing marked simplified method by the following steps:

a) Draw the line marked work line *1* and mark off diameter and radius as indicated by points *A-1'-R*. From radius point *R* draw a line at 90 deg to work line *1*. With the point *R* as center and *R-1'* as radius draw a 90 deg arc and divide the arc into eight equal spaces as indicated by points *1'* to *9'*.

b) Through radius point *R* and division point *2'* draw a line. This is the line of intersection between elbow gores 1 and 2, the angle of which is common to all gore intersections. From diameter points *A* and *1'* on work line *1* draw lines at 90 deg to intersect miter line *R-2'-7*. Transfer height *1'-2'* to line *A-7* (as indicated by arrows) and draw a line from center point *4* to point *1*.

c) From point *D* as center and *DA* as radius draw a quarter circle and divide into 3 equal spaces. From the division points draw lines perpendicular to work line *1*, intersecting miter line at points *1, 2, 3, 4, 5, 6, 7* as shown on short method drawing.

Second Step:

To layout patterns.

a) Draw a layout line representing work line *1*, the length of the line found by multiplying the pipe diameter by 3.14.

b) Divide the line into 12 equal spaces and through the points draw lines perpendicular to and extending above and below work line *1*.

c) Letter lines to correspond to simplified method drawing and transfer heights *D-4, C-5, B-6, A-7, E-3, F-2* and *G-1* from drawing to layout.

d) Connect the points to complete pattern outline.

Third Step:

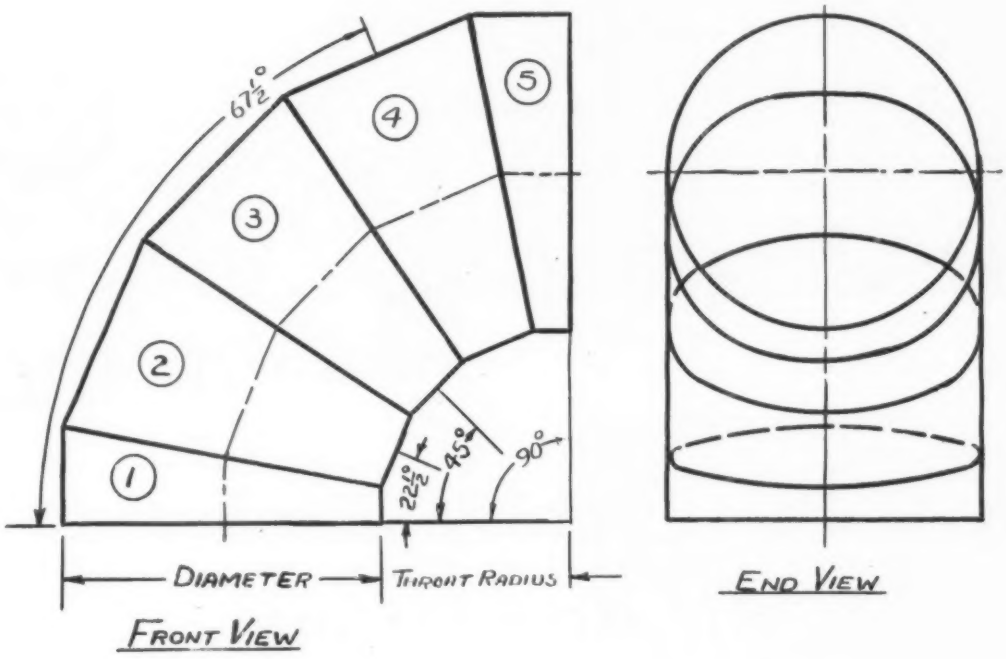
a) From full gore pattern mark off 4 sections.

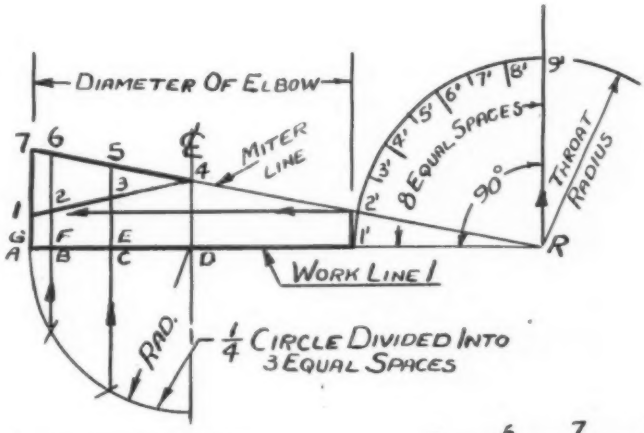
b) To obtain the end or half gore cut one of the full gore patterns on work line *1*.

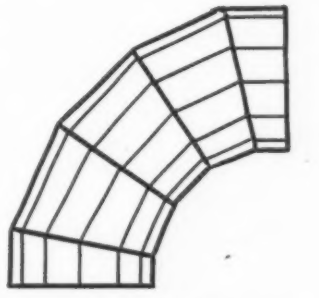
c) Make necessary allowances for seams and joints.

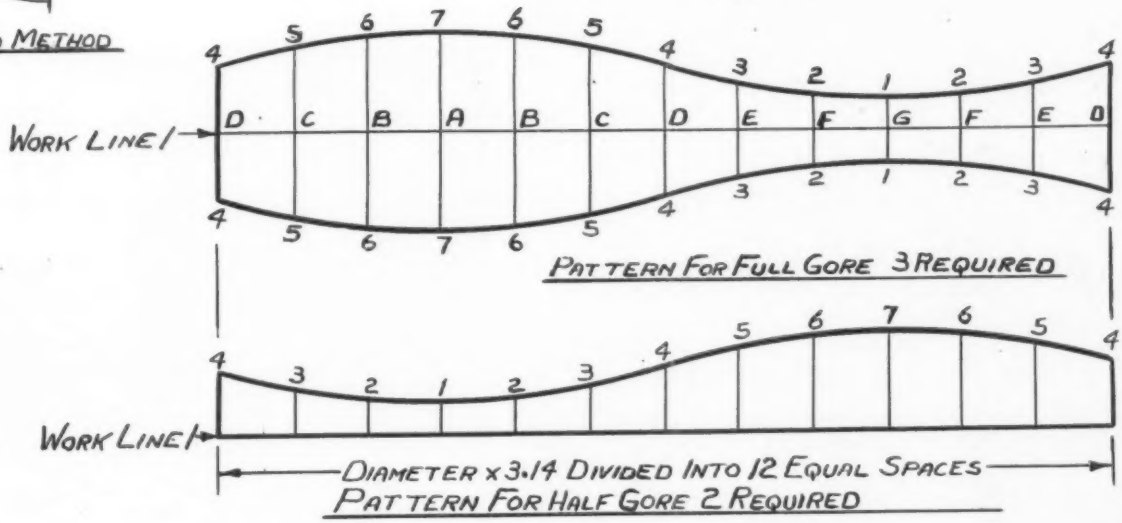
d) Roll and assemble to complete elbow.

Sheet Metal Pattern








WORK LINE 1
PATTERN FOR FULL GORE 3 REQUIRED
WORK LINE 1
DIAMETER x 3.14 DIVIDED INTO 12 EQUAL SPACES
PATTERN FOR HALF GORE 2 REQUIRED

Five Piece 90 Deg Elbow – Hugh B. Reid

The photo at the left shows the Naval Gun Factory as it appears today. Below is a drawing which gives its appearance 150 years ago.

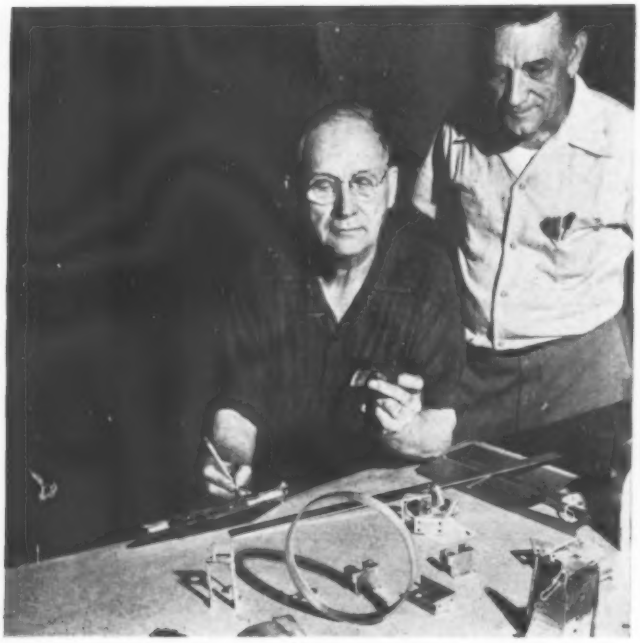
Official Navy Photograph

Naval Gun Factory Celebrates 150th Anniversary

Sheet Metal Workers' Journal **recently published this article which emphasizes the importance of the sheet metal craft in the nation's defense program. This is a modification of the original article and is published with the *Journal's* permission. Photos are by Ransdell, Inc. from the *Sheet Metal Workers' Journal*.**

METAL workers have been the armorers of mankind since early man began fabricating spear and shield. The purpose of the metal worker or the armorer has been the same through the ages—to develop the latest and best techniques in metalworking and fabrication offering the maximum in tactics or the necessities of military defense.

This purpose is basic and the skill and experience of these men are needed in military ordnance no matter what the task. Sheet metal workers have played a vital



Louis M. Wicklein, SMWIA general secretary-treasurer, and Rear Admiral F. G. Fabrion, superintendent of the factory, examine some weapons work with one of the veteran sheet metal workers.

Left, checking some small precision parts for armaments.

Examining a new stainless steel draining table destined for some naval establishment.

Coppersmiths at work on new type missile which demands exacting skill and workmanship.

part in the history of armament in this country. They have also taken an important role in the development of the U. S. Naval Gun Factory in Washington, D. C., into the world's largest armament plant.

Types of Workers

Workers in sheet metal in the first years of the Washington Navy yard (as it was originally titled) appeared in three general categories: copperers, whose job it was to cover the bottoms of warships with thin sheets of copper and to line the magazines of vessels with the same metal; plumbers, whose work included the use of sheet tin or copper, as well as the traditional lead; and the coopers, who made nun buoys and small boxes or chests of light-gauge metal. All three types of workers have practiced their craft at the U. S. Naval Gun Factory since the first vessel hove into sight down the Eastern Branch.

Masters Appointed

The status of these workmen was made official in 1804 when an Act of Congress provided for the employment of one master in each category. Benjamin King was appointed master plumber by Secretary of the Navy Robert Smith on April 12 of that year. The names of the two other appointees have since been lost.

Induction heating used to braze shells.

The admiral and Mr. Wicklein at another step in the production process in the factory.

Workers check squareness of fabricated assembly.

Flux being applied to shell-casing prior to brazing.

Mr. King served in his capacity for more than thirty years and did many interesting jobs during that time.

In December, 1807, workmen at the Washington Navy Yard were engaged in making the bodies of two experimental torpedoes for Robert Fulton of steamboat fame. These torpedoes were made of sheet copper somewhat thicker than that used for sheathing the bottoms of vessels. In November, 1810, Benjamin H. Latrobe procured three sheets of lead for use in the construction of the House of Representatives and the Senate. Mr. King and some plumbers from the Yard were sent at the same time to repair the gutters of the west side of the capital.

Rebuilding the White House

When it became necessary to rebuild the White House and the capital after they had been burned by the British in 1814, Benjamin King was borrowed from the Yard to do plumbing and roofing at the White House. During May, 1817, plumbers from the Washington Navy Yard were again at work on the White House, and in September of that year the Washington Navy Yard built and installed one of the first water closets in the presidential mansion.

The following is a schedule *per diem* wages paid at the Washington Navy Yard during the years indicated. The figure shown is the highest wage in a scale which was subject to considerable variation.

	1803	1804	1805	1806	1814	1815	1816	1818
Plumbers	1.50	1.50	1.50	1.70	1.24	1.50	1.75	1.25
Coopers	....	....	....	1.25	....	....	....	....
	1819	1820	1823	1836	1864			
Plumbers	1.12	1.00	1.98	1.18	3.25			
Coopers	1.76	1.44	1.08	....	3.00			

* * *

When President Garfield lay dying, victim of the assassin's bullet, the Washington Navy Yard was called upon to build special ice boxes with metal ducts which could be placed in the basement of the White House. These boxes were then connected to the ventilating system. Air was blown through the ice boxes by launch motors which were used as fans. In this way cool air was forced into the President's room, making it more comfortable for him in the summer's heat.

An Ideal Sheet Metal Shop

LAWRENCE E. GICHNER
Gichner, Inc.
Washington, D. C.

One of the most prominent sheet metal contractors in the nation's capitol visited a Cleveland shop and came away with many fine things to say about its efficiency.

A SHEET metal shop which is outstanding for its efficient layout is the firm of Mannen and Roth Company of 9104 Woodland Avenue, Cleveland, Ohio.

This writer has seen shops from New York to California, from Wisconsin to Texas, as well as in South America and the West Indies, but if he were to rate all shops in the ventilating field for perfection of layout, this Cleveland plant would rank near the top.

Material is received at the rear door, fabricated, and shipped from the front with a smoothness of performance difficult to equal. The sheets seem to slip right through to completion and in these days of rush and high labor costs, this is an objective much to be desired. A great deal of the efficiency with which jobs are handled can be attributed to the good condition of plant and equipment. The shop is clean, the equipment well painted, work tables are handy, and illumination is provided by modern fluorescent lights.

This present set-up is not a rushed-together affair, but the result of years of careful planning. Dion E.

This shear was recently added to the equipment in Mannen & Roth's shop.

Another piece of equipment recently acquired was this press brake.

Mannen, vice president of the firm, is a third generation sheet metal contractor; his grandfather, John Mannen, was one of the pioneers in the industry of Cleveland.

The present plant occupies 60 by 150 ft on one of the city's main thoroughfares. Company offices are housed in a two story building adjacent to the plant. Parking facilities are provided for employees on a cement paved area next to the shop.

At present, all production is primarily ventilation or air conditioning ducts. Aluminum and galvanized steel are used in approximately fifty-fifty proportion.

Work Progression Well-Defined

Flow of work through the shop begins at a large door in the rear of the plant, through which sheets are brought to be unloaded into racks and piles according to gauge and size. From here, they progress to either of two power shears capable of cutting either 16 or 10 gauge steel. Next in the production line is the 10 ft, 10 gauge press brake from which the material is rolled to the work benches.

Large jobs now under construction or recently completed at the time of the writer's visit include St. John's Cathedral, Cleveland Clinic Foundation, Cleveland Art Museum, Clark Brothers at Olean, New York, Ohio Bell Telephone building, and the NBC television station at Brecksville, Ohio. The firm contracts work within a two hundred mile radius of their plant.

St. John's is one of the first, if not the first, cathedral in the world to be air conditioned throughout (AMERICAN ARTISAN, August, 1949, p. 101). Mannen and Roth have been working on the nationally renowned Cleveland Clinic for the past six years. On completion of their work, it will be one of the few such institutions of its size to be entirely air conditioned.

In line with their policy of efficient management, the firm has recently installed several pieces of new equipment to take care of the increasing volume of work. These include a 6 ft press brake and a 10 ft power shear.

Mannen and Roth now employ approximately 25 mechanics and 3 draftsmen. Leonard Raeder, shop superintendent, has worked for three generations of Mannens since he learned his trade from John Mannen, founder of the company.

Shop Superintendent Raeder at the layout bench.

The smaller press brake is used to blank drive cleats in this photo.

Scientific Shop Layout (XI)

ERNEST E. ZIDECK
Sheet Metal Consulting Engineer

The eleventh of a series designed to present the latest in shop layouts and techniques for efficient production to our readers. The author's experience in sheet metal design and production has enabled him to show step-by-step the way in which a sheet metal shop can be made to operate most effectively and economically.

FABRICATION of housings for fluorescent lights is the principal business of the sheet metal shop shown in Fig. 1. Since there is a constant change in design of these housings it is almost impossible to plan a set of dies which can be used for a long production run. For this reason the product remains in the field of sheet metal fabrication, using all the familiar processes and tools. Housings are blanked, formed, welded and enameled. Final assembly includes installation of the electrical connections and this is done in the room *9*. Small parts are stored in this room and the finished housings are also held there before shipment.

During the production process the raw material leaves material storage *M* for blanking at *3*, blank preparation at *4*, forming at *5*, fitting at *6*, fastening at *7* and grinding and finishing at *8*. This product requires a heavy coat of interior white enameling to reflect light. The exterior of the housing is frequently finished in a color which will blend with the ceiling from which it will be suspended. Enameling, therefore, may be considered the most important part of this fabrication. Ventilation of the enameling process will be discussed, primarily, in connection with this shop.

Paint Won't Cling to Smooth Finish

This contractor's experience had shown that paint will not adhere closely to highly finished, buffed metal surfaces and that a finishing process which eliminates the pores in the metal will allow the paint to peel off. For this reason the metal surface of the housing is roughened, weld seams are ground down and deep scratches removed but no attempt is made to secure a fine finish. In some cases the product was buffed smooth and then sand-blasted to give a surface which paint could grip. Procedure in this shop now is to apply a prime coat and then rub it down before the application of the finish coat of enamel.

Settling on the process just described did not solve all the problems of obtaining a durable, smooth finish. Another difficulty arose in the presence of dust and vapor drops which settled on the surface of the housing, causing sandy spots on the metal and blemishes in the enamel. At times the finish coat peeled right off. It was found that the finishing process was being affected by use of a water-fall paint spray booth and the primer rub-down.

Warm Air Cleans Housings

A remedy was found by using warm air from the drying oven to blow all the moisture and dust off the housings. This air was then exhausted by a duct indicated over the bench *D-T* in the drawing. A 30 in. exhaust fan was installed at the central *V* and ducts were connected to it from all booths as shown by the dotted lines. Then all impurities in the air and all vapors issuing from degreasing, water-fall and spray-painting were drawn off so they could not settle on the housings being processed.

Ventilation Improves Quality

Paint fumes from the oven itself are collected by the ventilating system which is regulated according to the heat in the oven. Thus, the large, central exhaust fan collects not only dust and vapors from all parts of the enameling room, but also wasted paint spray and fumes from baked paint in the oven. These ducts require frequent interior cleaning (which is done through sliding doors) as the paint accumulates rapidly. But this is compensated for by the excellent finish which is obtained on the product.

The conveyor system is well-suited to its purpose. The light housings are long and narrow and they are placed in wire cages on the moving chain. The entrance to the drying oven for the conveyor is not a door but an elastic asbestos web and the cage pushes the web open to allow the housing to enter.

Primer Dries Quickly

One factor in the design of the conveyor was that the primer requires a shorter drying period than the finish enamel. For this reason the primed housings travel only the distance marked *P-B* while those with the finish coat move from *E* to *O*. After the baking of the finish enamel the housings are removed from the conveyor and taken to the assembly room *9*. Two

Fig. 1 Fluorescent Light Housing Fabrication

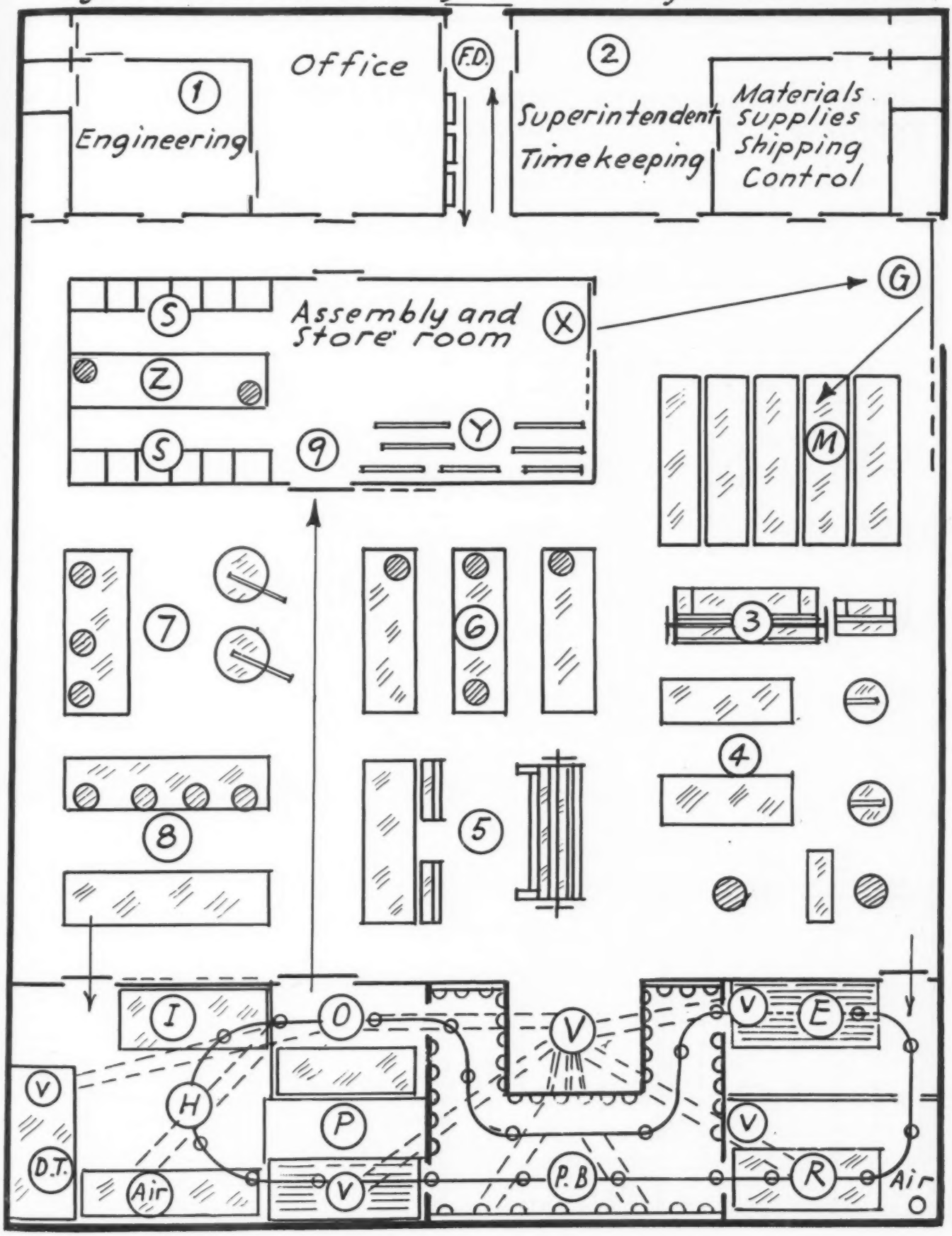
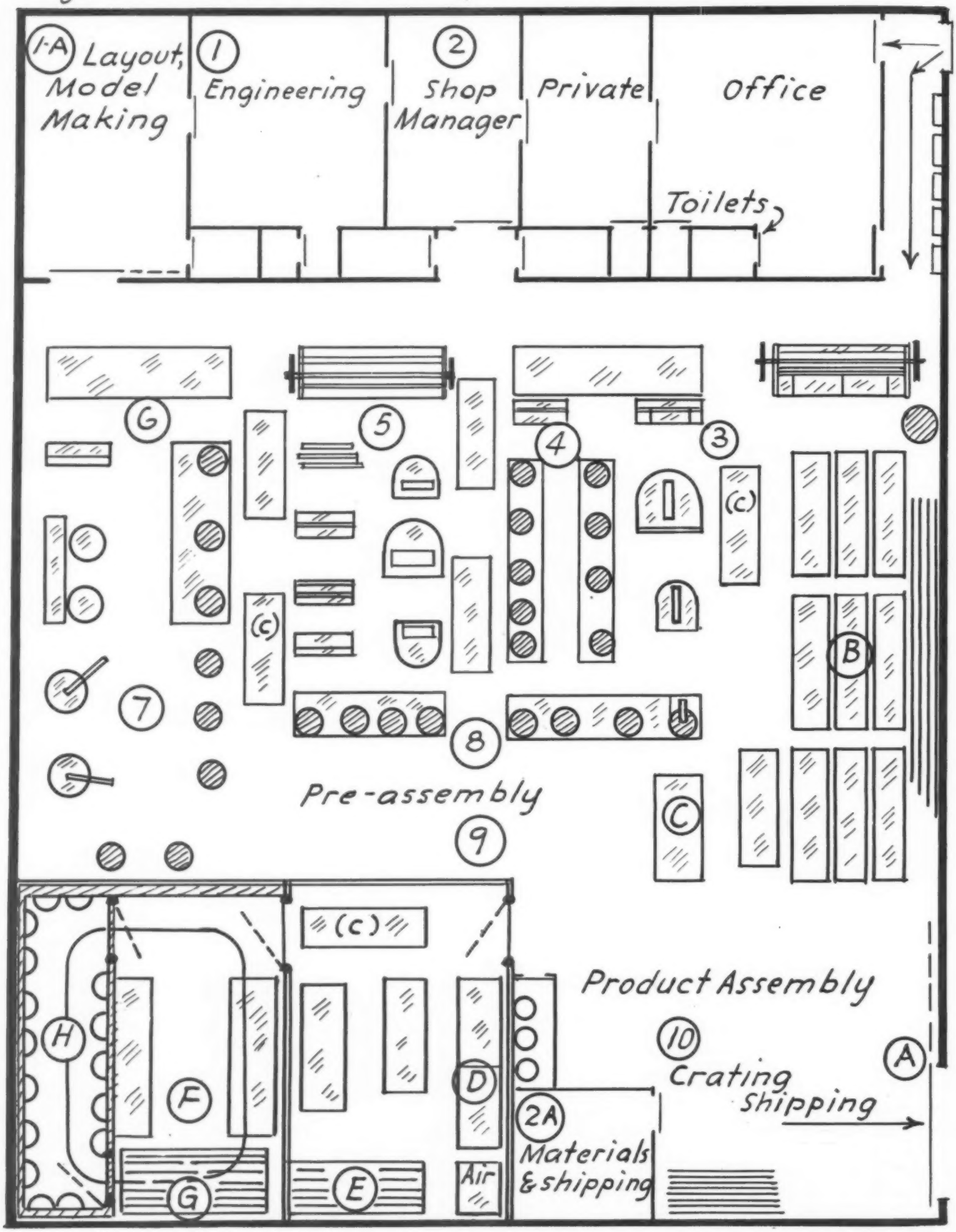


Fig. 2 Fabrication of Hospital Furniture



exhaust ducts are provided at *P-B* to prevent the primed housings from giving off fumes which might harm the finish enamel.

Problems and solutions mentioned in this discussion may be valuable to a ventilating contractor called upon to install a similar system.

Making Laboratory Units

Fig. 2 shows a sheet metal shop devoted to the production of medical laboratory units and cabinets for surgical instruments. These products are made in small volume and demand a high degree of skill on the part of the maker. Most important feature of the equipment is the sanitary aspect which requires smooth interior surfaces and tight exterior joints. Because of these sanitary requirements these units are completely assembled and then enameled as the last production step.

Every detail of production is arranged by the engineering department in this organization. Layout and production of pilot models are handled at *1-A*. Production sequence is as follows: materials are received at *A* and stored at *B;* blanked at *3*, parts are prepared at *4*, forming is done at *5*. Fitting takes place at *6*, fastening at *7*, and finishing at *8*. Final assembly is handled at *9* and *10*, prior to enameling and shipping.

Corners Are Rounded

Most of the tools used in this shop are standard and will be found in any sheet metal shop. At one stage in the production process small forming presses are used to produce the rounded corners which are required in the equipment manufactured. As indicated above the purpose of these rounded corners is to make it possible to clean the equipment more easily. At station *6* are located the usual bench tools, with portable units as needed, for this step in fabrication is one that calls for exacting work. Grinding and weld finishing at *8* is done largely by hand tools, since most of the products are too large to manipulate on stationary grinding wheels. Specification of solid joints calls for considerable welding and brazing, so there is quite a bit of finishing needed.

Finish Is Important

These units are produced at a slow pace and the enameling is a matter of great care. The complete assembly is brought to *D* for degreasing and drying where it is then loaded on a metal carrier *C* and primed at *E*. This prime coat is dried in the oven *H* and then the cabinet is returned to *D* for rubbing down and removal of any flaws in the surface. These flaws are observed more easily after the prime coat has been applied. Any gaps in the joints are smoothed over with metal putty which hardens with heat. Another coat of primer is applied and the same process is repeated until the surface is judged to be ready for the application of the finish coat of enamel. As a rule, only one unit is enameled at a time, so no effort is made to hurry the process.

To return to the subject of the sheet metal shop itself, it is apparent that the building here is wide enough to permit arranging operations side by side. This arrangement is often an efficient one, but many shops are long and narrow and would not allow such a setup.

This series has brought out a number of suggestions for efficient operation of a sheet metal shop. These suggestions are: first, material delivery and storage that does not interfere with production; second, all shearing and blanking tools should be located near the materials; third, free handling of the product between preparation and forming; fourth, the process called fitting *6* should be located between forming and binding (which includes seaming, riveting, welding and soldering); fifth, operations under category *7* should be separated from the other operations and the fumes exhausted; and sixth, there should be sufficient free area available for the assembly operations. Of course, adequate aisles should be maintained between the areas set off for specific operations.

Shop arrangement is subject to conditions present in existing buildings as a general rule. This series of drawings has attempted to show that orderly production can be achieved no matter what the shape or size of the building. Attention paid to the planning of production lines pays off in increased production and worker efficiency.

Safe Strength of Rope

MATERIAL HANDLING EQUIPMENT has come into widespread popularity as a means of reducing the costs of production in shops of many kinds. In the process of using this type of equipment a question sometimes arises as to the safe loading of a rope or cable.

There are two strength characteristics of ropes that are to be found in any engineering handbook. One is the ultimate strength of the material and the other is the working strength. It is more customary to make use of the working strength since a good safety factor is then provided against any possibility of breakage when load is applied. An easy way to calculate the working strength has been developed which makes it unnecessary to refer to a handbook for the safe stress.

To find the safe loading of a cotton or hemp rope take the diameter of the rope, in inches, square it and multiply the product by 200. For a ½ in. hemp rope the result would be:

$$\frac{1}{2} \times \frac{1}{2} \times 200 = 50 \text{ lb or the safe strength}$$

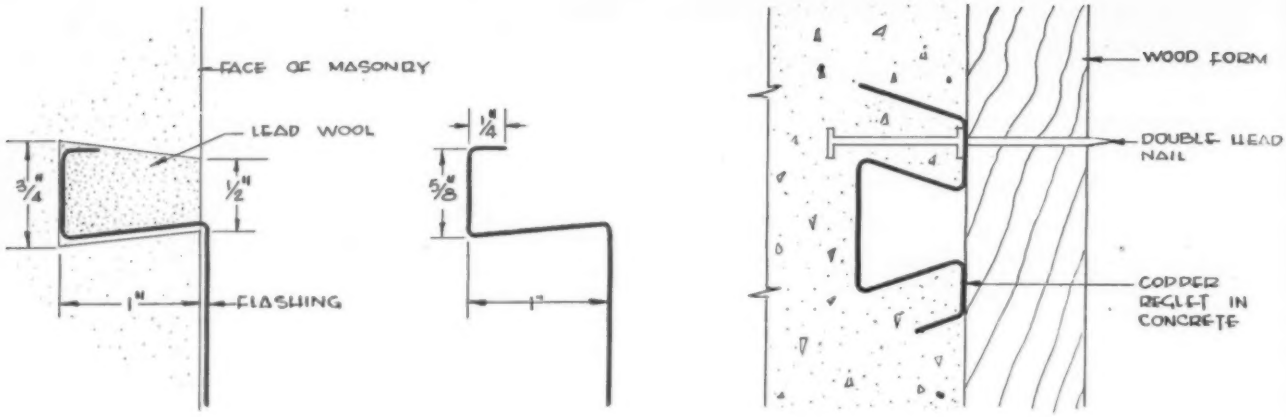
When using steel rope (cable) there is probably less tendency to be concerned about the working load than when hemp rope is used. In spite of the greater strength of the steel rope it is just as dangerous to take chances when using it. Here is the formula for the working strength of steel rope: Square the diameter of the rope in inches and multiply by 12,000.

Here is a sample calculation, for ½ in. steel rope:

$$\frac{1}{2} \times \frac{1}{2} \times 12{,}000 = 3{,}000 \text{ lb working strength}$$

This rule should only be applied to steel rope since rope made of iron wire is considerably lower in strength.

—W. F. SCHAPHORST
Newark, New Jersey



REGLET FLASHING IN MASONRY FIG. 4

(From page 93)

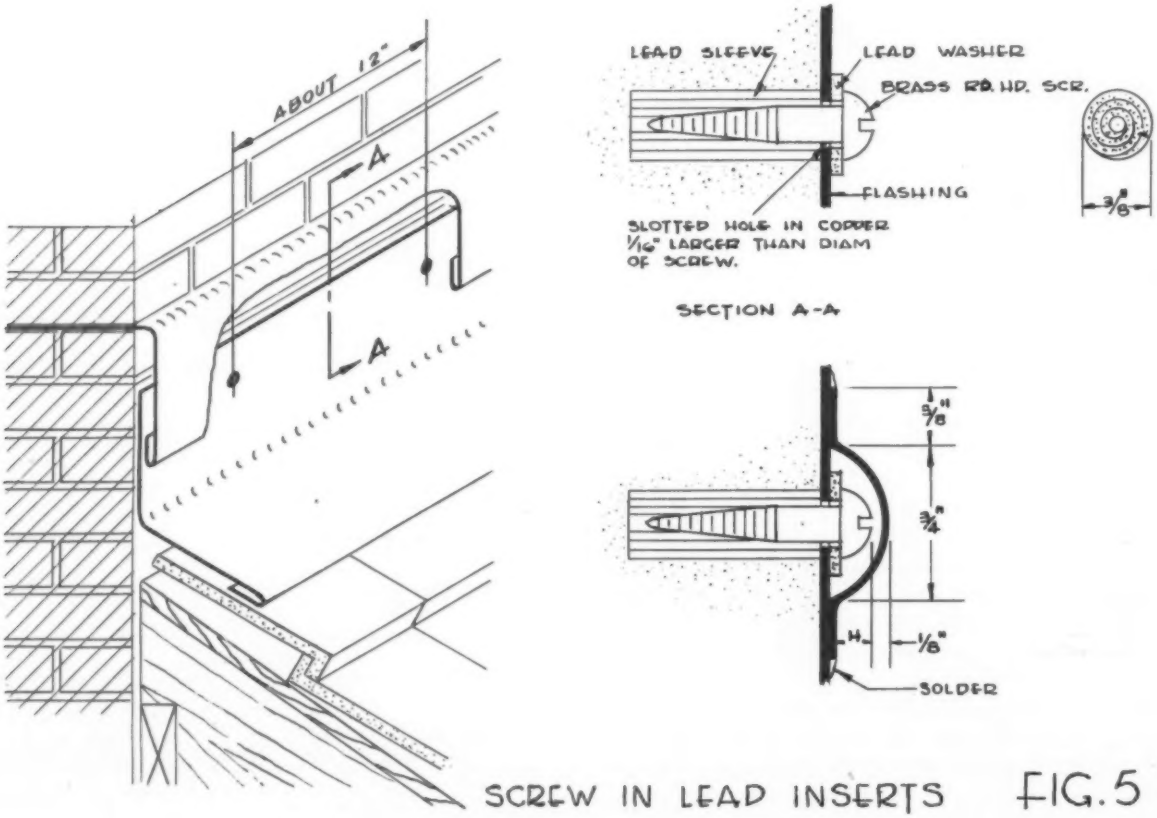
must be placed to turn all water and moisture to the outside face, where additional means of rapid drainage are provided.

. . . no matter how good a material may be, if it is misused it cannot perform satisfactorily. Copper, as well as all other materials, must be used properly if it is to give the traditionally fine service that is expected of it.

Copper is a good roofing material with an old and honorable record of enduring service. A good material deserves good design and workmanship, both of which depend in large part on a thorough understanding of copper as a live—not inert—material. Nothing but trouble can come of an effort to economize on first cost by skimping on workmanship. And the time to be sure design does not ask sheet copper to do the impossible is before installation.

It is highly important that a competent and reliable sheet metal firm be employed. A contract purchased solely on a price basis will be just that and nothing more, no matter how exacting the specifications may be."

High job costs are not due entirely to labor rates and material prices. The best of materials (from a use viewpoint) and the most skilful workmanship are not efficient partners measured by the economic standards of initial and maintenance costs unless they come together naturally and as the logical result of intelligent planning—on the drafting board, on the estimating desk, on the shop bench, and on the job.



SCREW IN LEAD INSERTS FIG. 5

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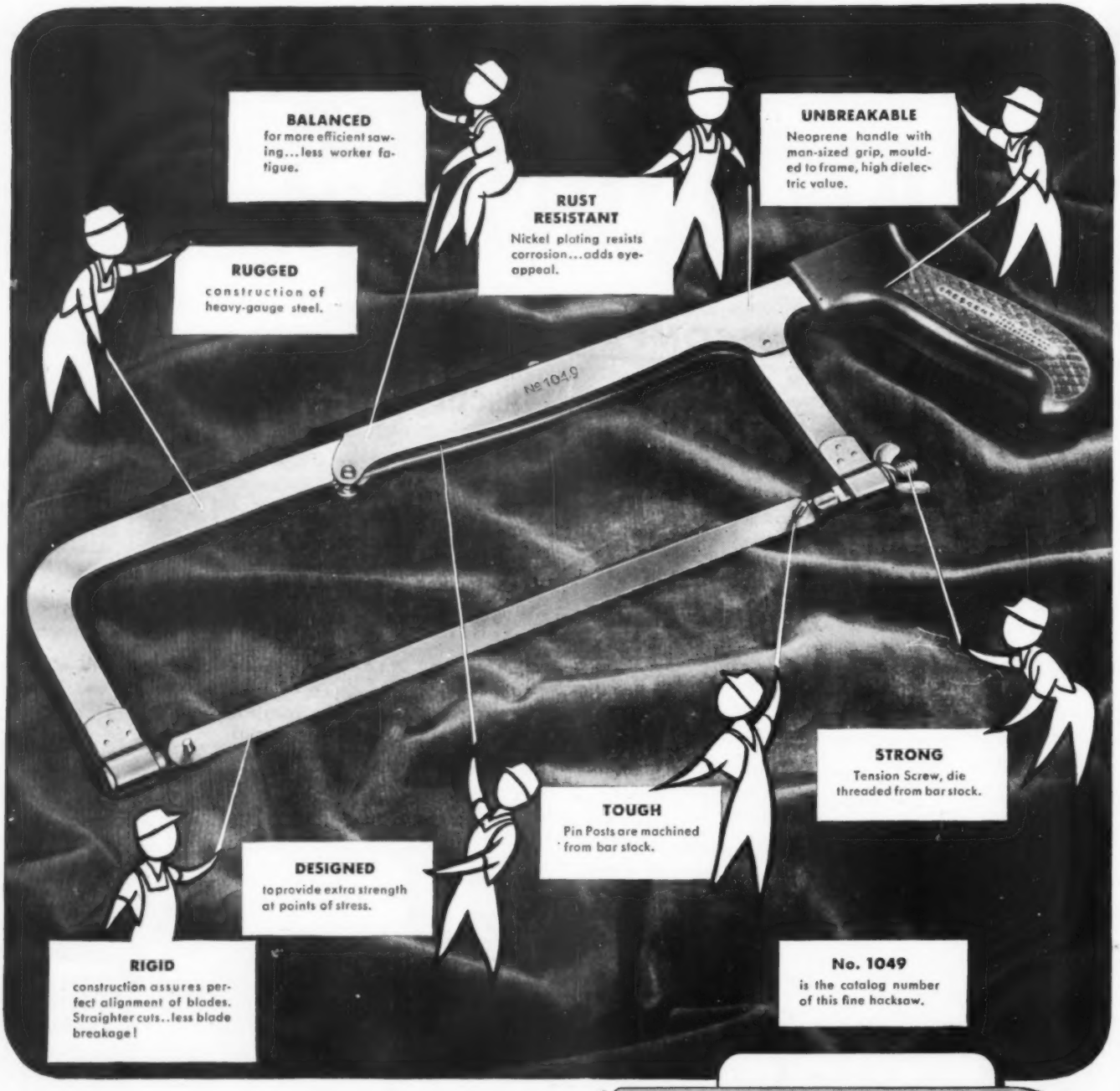
CRAFTSMEN RECOGNIZE QUALITY *by these fine features in a* HACKSAW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for more efficient sawing...less worker fatigue.
RUST RESISTANT
Nickel plating resists corrosion...adds eye-appeal.
UNBREAKABLE
Neoprene handle with man-sized grip, moulded to frame, high dielectric value.
RUGGED
construction of heavy-gauge steel.
№1049
STRONG
Tension Screw, die threaded from bar stock.
TOUGH
Pin Posts are machined from bar stock.
DESIGNED
to provide extra strength at points of stress.
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construction assures perfect alignment of blades. Straighter cuts..less blade breakage!
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CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

Detroit

The Detroit Association of Warm Air Heating and Sheet Metal Contractors, Inc., has officially changed its name and will now be known as the Detroit Warm Air Heating Association, according to a recent news letter from N. J. Biddle, association secretary.

This same news release reports that the heating business is booming in the areas served by the Michigan Consolidated Gas Company since the unlimited release of gas heating units on August 1, 1949. The Detroit association is continuing its efforts to safeguard the public in its choice of heating contractors by means of advertisements and articles in the Detroit papers.

The first article, published in the August 5th issue of The Detroit News, was entitled "Get Proper Gas Heating Equipment, Home Owners Advised." The second article, written by Mr. Biddle, appeared on August 19 in the same paper. Its success was demonstrated by the number of calls subsequently received by the association office and by member contractors.

Mr. Biddle's article headed "Selection of Contractor Is Key to Assured Heating Job" is now available to members in reprint form for use as an advertising medium or for distribution in conjunction with sales promotion letters which member firms may be using in their campaign.

The association feels that the advertising done by the member contractors and the space accorded to these articles in The Detroit News has been valuable to the public, the industry, its members, and to the association itself.

Florida

The first quarterly directors meeting of The Roofing and Sheet Metal Contractors' Association of Florida was held at Hotel George Washington, West Palm Beach. In addition to George Warren, president of the association, who presided over the meeting, directors in attendance included: Jack Tucker, Ocala; John Caldwell, Orlando; Jack Gross and Howard Carpenter, West Palm Beach; Al Ferguson and Mack Fillingham, Jacksonville; Ellard Kohn and Bill Palmer, Miami; S. L. Boyett and Otto Krause, Jr., St. Petersburg; O. J. Nettles, Tallahassee; and Jack Montgomery, Coral Gables.

Mr. Warren's proposal that the association appoint a paid executive secretary was unanimously approved and the directors agreed to underwrite the expenditure for the balance of this term. The president appointed Porter D. Arnold to serve the balance of the term as executive secretary. Mr. Arnold will edit and supervise the preparation of the monthly bulletins issued by the association.

(Please turn to page 112)

Coming Events

Oct. 17-20—American Gas Association, Annual Convention. Palmer House, Chicago, Ill. Kurwin R. Boyes, Convention Manager, 420 Lexington Ave., New York 17, N. Y.

Nov. 14-18—Refrigeration Equipment Manufacturers Association, 6th All-Industry Refrigeration and Air Conditioning Exposition. Atlantic City Auditorium, Atlantic City, N. J. George E. Mills, Show Director, All-Industry Exposition, 1346 Connecticut Ave., N.W., Washington 6, D.C.

Nov. 18-19—Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania, Annual Convention. Berkshire Hotel, Reading, Pa. E. W. Liebermann, secretary-treasurer, 1411 Merchant St., Ambridge, Pa.

Dec. 14-15—National Warm Air Heating and Air Conditioning Association, 36th Annual Convention. Hotel Cleveland, Cleveland, Ohio. George Boeddener, secretary-treasurer, 145 Public Square, Cleveland 14, Ohio.

Jan. 23-27, 1950—American Society of Heating and Ventilating Engineers, Southwest Air Conditioning Exposition of the International Heating and Ventilating Exposition. State Fair Grounds, Dallas, Texas. E. K. Stevens, Associate Exposition Manager, Grand Central Palace, New York City.

Feb. 2-3, 1950—Sheet Metal and Warm Air Heating Contractors Association of Indiana, Inc., Annual Convention. Hotel Severin, Indianapolis, Ind. Frank E. Anderson, Secretary, 439 So. 17th St., Terre Haute, Ind.

Apr. 11-13, 1950—New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., Annual Convention. Hotel Syracuse, Syracuse, N. Y. Clarence J. Meyer, Secretary, 567 Genesee St., Buffalo 4, N. Y.

May 8-10, 1950—Sheet Metal Contractors' National Association, Annual Convention. Netherland Plaza, Cincinnati, Ohio. J. D. Wilder, executive secretary, 170 Division St., Elgin, Ill.

EQUIPMENT DEVELOPMENTS

Hi-Boy Furnace 185

Model 141-CAO hi-boy furnace is equaly adaptable to conventional or basementless small homes. Operating on the counterflow principle of pre-heated air, it has a 75 to 80 per cent heating efficiency.

Furnace is completely assembled at the factory. Automatic controls and oil burner are easily accessible for servicing by opening upper front door of furnace casing. Entire fan and motor unit is mounted on rails to facilitate removal for servicing.

Dimensions of complete unit are 25 x 28 x 62 in. Further details are available in Bulletin No. 902-C.

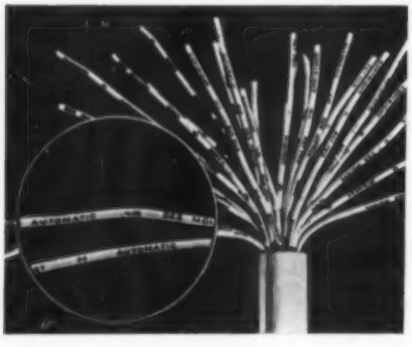
Certified Furnace Co., 1000 Berry Ave., St. Paul 4, Minn.

Numbered Wire 186

New type wire for electric controls uses numbers instead of color-coding to increase ease and accuracy of installations and maintenance. Known as Magic Wire, each wire has its code number imprinted in red on every inch of the yellow insulation.

Two advantages are claimed by the manufacturer: the numerals do not wash or wear off, or become discolored with age; and there is no limit to number of different numerals available.

With terminals numbered to correspond with the numerals on the wires, installation costs and trouble-shooting time are said to be reduced as much as 50 per cent.



Use Coupon on Facing Page

Magic Wire is available in No. 16 solid wire with plastic insulation. Other sizes and types, and any specified brands of wire, are available on request.

Midwest Automatic Control Co., 510 Third St., Des Moines, Iowa.

Oil-Gas Unit 187

Packaged utility furnace, Model UF-26, features a drawer type burner assembly that permits easy installation of either oil or gas burner, or allows for later change of fuel by merely changing the assembly. Unit is factory assembled, ready for attachment of oil or gas line, thermostat, and power line when installed.

With bonnet rating of 10,000 Btu, unit is designed for use in either conventional up-flow type of air circulating system or in newer perimeter type heating system which calls for down-flow air circulation.

Vaporizing and pressure type oil burners, as well as burners for natural, artificial, or LP gas are available from the manufacturer.

Other features are channeled air circulating type of casing; suspended type blower; large combustion chamber and secondary heat transfer unit; cold air return at either side or bottom.

The Majestic Co., Huntington, Ind.

Horizontal Air Renewer ...188

Horizontal or ceiling type Air Renewer, Series 1700, has been designed to be made part of the return air duct or plenum of any forced warm air furnace equipped with blower. This unit, which provides air humidification, purification, and cleaning, is available in two sizes, 1200 and 2400 cfm. The

1200 cfm unit is equipped with four 15 in. germicidal lamps; the 2400 cfm unit, with two 36 in. lamps.

The suspended Air Renewer is shipped completely assembled. Outer jacket is finished in attractive baked enamel.

The Brundage Co., 500 North Park St., Kalamazoo, Mich.

Dual Base Grilles 189

Dual base grille sets have been developed especially for use with dual base floor furnaces. Their design is adapted to the particular requirements of such furnaces.

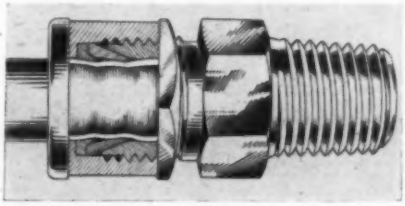
Grilles are available in new Dura-Luster and in standard finishes.

Auer Register Co., 3608 Payne Ave., Cleveland 14, Ohio.

Slip-On Fittings 190

Clinch-type fitting for use with any type of metal or plastic tubing is marketed under trade name of Swagelok. These fittings provide leakproof seals at three points. Two ferrules and a threaded chuck inside the nut clamp around a tube

with virtually no effect on inner walls, thus leaving flow of liquids or gases unimpeded.



Assembly operations are said to be aided by design of fittings, which require no disassembly before use. Swagelok is simply slipped onto the end of a tube and given one and one quarter turns with any standard wrench. Fittings may be obtained in brass, aluminum, steel and stainless steel, Types 303 and 316, as well as in Monel, a recent addition to the alloys in which Swagelok is available.

Crawford Fitting Co., Cleveland 17, Ohio.

Electric Janitor Kit 191

An electric-hydraulic temperature control system is now available for installation on hand-fired house heating plants. This new device, which automatically adjusts dampers and checks, is completely self-contained and can be installed by the home owner himself.

Compact motor assembly is spring loaded so that in event of electric power failure, the dampers of the heating plant will close down automatically to guard against excessive heat.

The small motor (illustrated) uses both electric and hydraulic power to position dampers and checks. Assembly itself consists of an oil encased motor which operates a hydraulic pump. The pump, in turn, forces oil against a diaphragm to move the arm connected, by pulleys and chains, to the dampers of the heating plant.

The complete set, called the Y219A Electric Janitor Kit, is available as a package and includes motor, thermostat, chains, pulleys and fittings.

Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.

Coal Fired Furnace 192

Warm air Anthra-Flo unit, equipped with rectangular burner, employs the cross-feed principle to assure uniform feed to entire burner surface. Coal feeds over a perforated plate and ashes drop over the edge into an enclosed container, eliminating any ash removal mechanism.

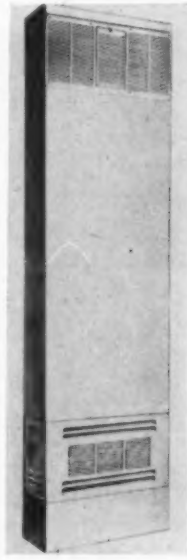
Circulation fan with filters, which supplies filtered warm air to the duct system, is standard equipment.

Overall dimensions of outer casing are 52¾ in. long, 25⅛ in. wide, and 52 in. high. Unit is rated at 85,000 Btu when burning buckwheat.

Coal-O-Matic Co., Trucksville, Pa.

Jet Flow Heater 193

New model Jet Flow heating unit is now available in smaller sizes, factory assembled, and enclosed in masonite cabinet which can be papered or painted to blend with home decoration.



The 45,000 and 55,000 Btu input units measure only 10⅜ in. by 27⅜ in.; the 25,000 and 35,000 Btu units occupy a space of only 10⅜ in. by 21 in.

Manufacturer claims that by use of the jet principle a velocity of 300 fpm is achieved, throwing heat to all parts of the average size home. Unit is installed above the floor and is said to be ideal for concrete slab and multi-story construction.

Royal Heaters, Inc., 1024 Westminster Ave., Alhambra, Calif.

MAIL THIS NOW!

We will ask the manufacturers to send full particulars about the products and literature mentioned. 10-49

Be sure to circle the items you want.

Equipment Developments

185 186 187 188 189 190 191 192 193
194 195 196 197 198 199 200 201 202
203 204 205 206 207

New Literature

315 316 317 318 319 320 321 322 323
324 325

Manufacturer ☐ Jobber ☐ Dealer ☐

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Address: AMERICAN ARTISAN, 6 North Michigan Ave., Chicago 2, Illinois

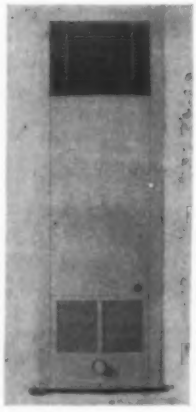
EQUIPMENT DEVELOPMENTS

Use Coupon on Page 109

Dual Wall Heater 194

Space saving, dual vented wall heater, rated at 45,000 Btu, fits into 14 in. space between studs of a standard 4 in. stud wall.

Model 45-WD a circulating type heater, employs louvers which direct the heat from both sides of a partition into the rooms and also shut off vision between rooms heated. Extra floor warmth is provided by a hidden intake in panels, which draws air from floor. Automatic shut-off valves are standard on all units.



Unit is mounted off the floor, thus eliminating need for alterations to flooring when heater is installed.

Holly Manufacturing Co., 875 South Arroyo Pkwy., Pasadena 2, Calif.

Ventilator-Register 195

Thru-the-Wall ventilator provides a ventilation opening that is weatherproof and screened against insects, as well as an attractive inside register that features airtight closing. The outside ventilator is made of steel, coated with zinc and bonderized for additional protection against the weather. Angular 2 in.-deep louvers are designed to keep out rain.

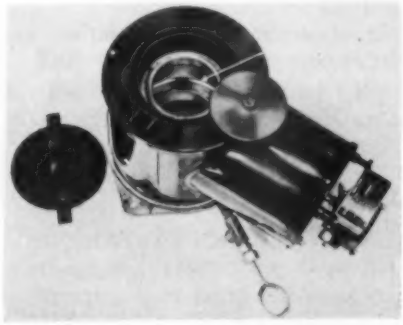
The inside register is also built of double protected steel and is finished in beige enamel.

Ventilator fits opening 14 in. wide by 6 in. high. Packaged as a complete unit.

Air Control Products, Inc., Coopersville, Mich.

Down Flame Oil Burner ...196

A forced draft Down Flame oil burner is featured as part of the advanced design of a line of residential heating units. The burner is said to be perfectly silent, producing an even, clean-burning flame, and is fully approved by Underwriters' Laboratories.



In the floor heater, the Down Flame principle permits burner to be located at the top, immediately below the grille, thus reducing the overall depth of the unit and eliminating hazard of heat failures which can occur when burners located at the bottom of the furnace are submerged by seepage or flood water. Access to burner and controls can be had by raising the grille, without dismantling any part of the installation.

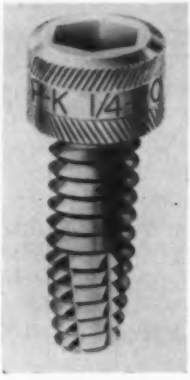
Dimensions of required floor opening are 26x30 in., with overall depth from floor level to bottom of unit of 36 in. Unit is shipped factory assembled and wired, ready for installation.

Twin Air wall models and a highboy model are also available with the Down Flame burner.

United Air Heaters, Inc., Seattle, Wash.

Self-Tapping Screw 197

New fastening device is announced as a self-tapping socket head cap screw. By eliminating tapping operations, the fastener offers advantages of speed and economy. Also, in assemblies where other fasteners used are standard socket head screws, a standard key wrench only is needed for driving all fasteners.



A data sheet prepared by the manufacturer includes information

Magnehelic Air Pressure Gauge.....198

Magnehelic gauge for checking air pressure is said to be extremely sensitive, responding to slightest pressure changes. According to the manufacturer, it is unusually efficient in checking furnace draft, testing filter resistance in ventilators and air conditioning equipment, measuring static pressure and air deliveries of fans and blowers, air velocity measurement from 400 to 10,000 fpm, and for checking operating efficiencies of such equipment as dust collectors and processing systems using air.

Gauge incorporates a flexible diaphragm supported by a cantilever spring which carries a magnet actuating the pointer assembly. The vertical motion of the diaphragm is transformed to rotary pointer motion by means of a helical magnetic linkage.

Plus, minus, and differential readings are available. Less than atmospheric pressures are connected below the diaphragm and above atmospheric pressures are connected above the diaphragm. Range is 0-½ in. of water to 0-12 in. of water.

Gauge is recommended as ideal for portable temporary use as well as for permanent installation on flow meters, control equipment, automatic valves, gas-air ratios, etc. All types of connections are possible: rubber tubing, ⅛ in. pipe thread, or ¼ in. copper tubing.

Further details are available in Bulletin No. 250.

F. W. Dwyer Mfg. Co., 317 S. Western Ave., Chicago, Ill.

on comparative holding power and recommended hole sizes.

Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

Oil Fired Conditioner 199

Oil fired winter air conditioning furnace, Highboy Model 65, features flange mounted oil burner designed for quiet and efficient operation.

Unit, which is factory made and assembled, measures 57 x 20 x 24 in. overall and is rated at 65,000 Btu at bonnet. Available with corrugated stainless or steel heat exchanger and Sirocco blower.

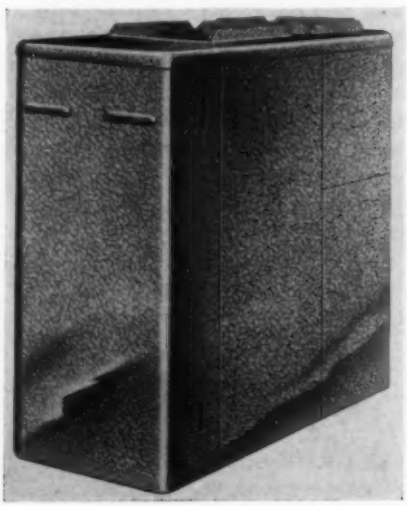
Standard color is shamrock green. Other colors available on quantity orders.

Quiet Automatic Burner Corp., Newark 4, N. J.

Compact Warm Air Unit..200

Warm air conditioning unit of 100,000 Btu capacity features high efficiency, quick accessibility, and ease of installation. It is fired with a burner which includes all the service features of the manufacturers' new model GCN, recently introduced.

Furnace incorporates a heat exchanger of the counterflow type. It is not packaged but is shipped with stainless steel combustion chamber in place, ready for firing. Burner is enclosed in a vestibule which is instantly removable.



Compact in size, the unit measures 25 in. wide, 55 in. high, and 59 in. long. Finish is green Hammertone enamel.

Gilbert & Barker Mfg. Co., West Springfield, Mass.

Ladder Bracket 201

Saf-Way ladder brackets, of improved design, may be used to hold a ladder clear of eaves, roof projections, and windows so that the user can work in a safe, convenient position.

Adjustment of the extended length up to 32 in. can be made while working on the ladder. Design of the bracket also provides a firm rest for a ladder when used on a corner. Feet extend sideways

a sufficient distance to span windows of normal width, eliminating the hazard of reaching awkward window areas. Rubber cushioned feet prevent side slipping and swaying.

Handi Equipment Co., 908 Tenth St., Racine, Wis.

Tank Safety Device 202

Compact safety device is designed to reduce danger of flash-back fire in atmospheric storage tanks. It combines patented pressure-vacuum vent valve with a flame arrestor bank which acts to prevent propagation of flame into storage tanks containing volatile liquids.

Use of flame arrestor bank with the vent valve prevents flame resulting from lightning or nearby fire from flashing back into the tank. Bank is of rolled aluminum construction and can be removed for cleaning or replacement by releasing retaining ring spring. Rubber-to-metal sealing makes the valve tight and prevents it from freezing shut.

Tested and approved by Underwriters' Laboratories.

Additional information is available on request.

Black, Sivalls & Bryson, Inc., Kansas City 6, Mo.

Perimeter Heating Unit ..203

Down Flow oil furnace is designed for heating basementless homes by the perimeter method. The unit, made to fit over a pit, has blower in the top and heat discharge at the bottom. Quiet operation is achieved by use of an insulated cabinet and unusual blower mounting.

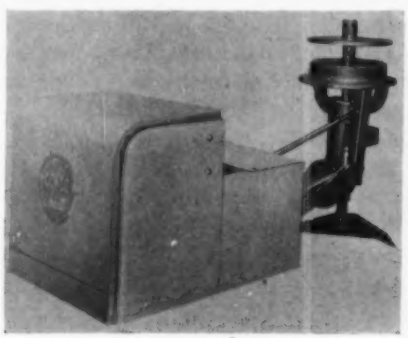
Equipped with pressure burner, the Down Flow furnace is available in two sizes, 70,000 Btu and 100,000 Btu. Units are finished in white or gold Hammertone enamel.

Dual-X Furnace Mfg. Co., Inc., Chicago 21, Ill.

Packaged Gas Burner 204

New gas burner for conversion use is available with input range from 60,000 to 210,000 Btu. Tradenamed the Monoflame, the burner may be had in Deluxe or standard models, both fully packaged and factory wired.

Use of a spreader type flame makes burner adaptable to a wide range of installations. Features include telescoping venturi mixer, automatic pilot, push button pilot



EQUIPMENT DEVELOPMENTS

Use Coupon on Page 109

lighter. Electric controls include solenoid gas valve, thermostat, and limit control.

Conco Engineering Works, Mendota, Ill.

Oil Burner Motor 205

Fractional horsepower motor has been designed especially for use on oil burners. Simplified design is achieved in part by providing a removable cover to allow enclosure of thermal cut-out switch inside the housing. Magnetic starting switch is readily accessible by removing a plate held in place with two screws. Reset button is centered in the end plate.

Motor housing and end bells are of sand cast aluminum for lightness and strength. All parts precision machined to close tolerances. Motor operates at 1725 rpm and is approved by Underwriters' Laboratories.

Nu-Way Corp., Rock Island, Ill.

Lock Rolling Machine 206

Additions to a line of lock rolling machines consist of a 22 in. model and a 24 in. model. Forming rolls are available for both models to form Pittsburgh locks, double seams, right angle flanges, and drive cleats. Installation of rolls is said to take only a few minutes.

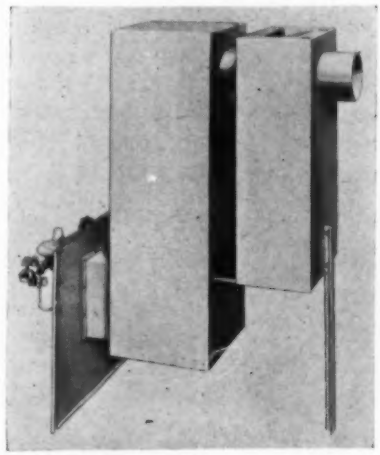
Machines incorporate double spindles, latest type pyramid shaved gears in gear reduction train for strength and quiet operation. All rolls are powered and equipped with Torrington needle bearings.

Roy G. Flagler Mfg. Co., Detroit 34, Mich.

Small Home Furnace 207

Gravity, gas fired furnace for small housing units is designed to give fully automatic heat at low cost. Has input rating of 75,000 Btuh and output at bonnet of 56,250 Btuh. AGA approved for all gases, for both low and high altitude operation.

Furnace features an extra large, heavy steel heating element which provides for extra-long indirect



heat travel and very large area of heating surfaces. Hot combustion gases are forced through vertical flues, and around strategically placed baffles in the radiator. Gases cannot leave the heating element until all usable heat has been extracted.

This unit, Q75G, has fountain type gas burner which is designed to permit operation on any gas without changing the burner proper.

The Meyer Furnace Co., Peoria 1, Ill.

Association Activities . . . *(From page 107)*

Indiana

According to an announcement in the latest news bulletin of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, the city of New Castle, Indiana, adopted the Indiana state building code in July of this year. The New Castle chamber of commerce has prepared and is now distributing copies of the city's Building Code Ordinance No. 573 which regulates the erection, construction, enlargement, alteration, repair, moving, remodeling, demolition, electricity, plumbing, heating, ventilating, and air conditioning of all public and private buildings in the city.

Provision is made in the ordinance for the creation of the office of building inspector and for issuance of permits and collections of fees for these permits. The powers, duties, and qualifications of the inspector are also defined.

The ordinance adopts Volume I, II, II and IV of the regulations and code of the Administrative Building Council of Indiana as minimum requirements.

* * *

The Indiana Association deeply regrets the passing of Charles C. McManama of Indianapolis. For the past 17 years, Mr. McManama was associated with the Indiana Machinery and Supply Company, and was always an active worker in association programs throughout the state.

Pennsylvania

The Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania, which was organized in December of last year, will hold a convention at Reading, Pa., on November 18 and 19. Headquarters will be the Berkshire Hotel in that city. The convention will feature addresses by outstanding speakers in several fields and a planned program of entertainment which promises to provide a most pleasant as well as interesting weekend.

At present, officers of the association are:

President .....A. J. Sabathne, Altoona
1st Vice President ....Walter E. Keist, Pittsburgh
2nd Vice President ..Louis Trost, Erie
3rd Vice President ...H. T. Lyons, Bethlehem
Secretary-Treasurer .E. W. Liebermann, Ambridge

Directors are C. F. Luppold, Reading; J. D. Sprucebank, Jeannette; Franklin Kottcamp, York; and A. R. Hoffman, Sharon.

NEVER BEFORE

AN AUTOMATIC HUMIDIFIER WITH THESE COMFORT-ECONOMY ADVANTAGES

MAID-O'-MIST Convector Humidifiers

Designed for fast and efficient evaporation of water, Maid-O'-Mist's narrow, individual troughs for each evaporator pad do not restrict the flow of heated air. Available in 13 different sizes, these humidifiers have evaporation capacities of 1 to 10 gallons of water per day. Made entirely of non-ferrous metal and equipped with automatic (float operated) supply valve.

60% LESS AIR RESTRICTION IN THE PLENUM—

The individual, narrow troughs have a minimum of air flow restriction which permits their use in small plenums. Result—heating efficiency, a boost to your professional reputation.

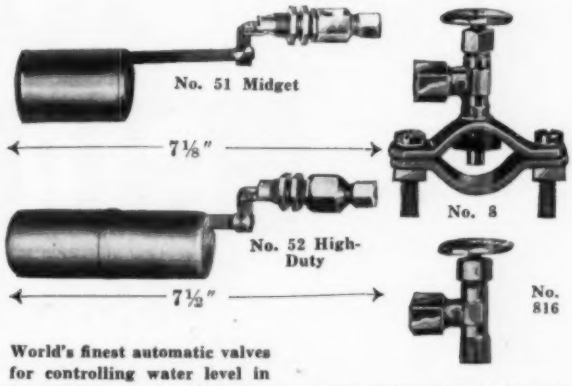
30% MORE EVAPORATING AREA—

Fast continuous humidification even at low furnace temperatures or when the thermostatic control temporarily cuts off. Result—satisfied customers, more business for you.

50% LESS INSTALLATION TIME—

You just cut out the opening in the plenum, attach the plenum flange frame, slip in the factory-assembled unit and make the water connections. A quick, easy profitable job for you.

MAID-O'-MIST BRASS FLOAT VALVES AND SADDLE VALVES FOR THAT INSIDE JOB



World's finest automatic valves for controlling water level in humidifiers, air conditioners, evaporative coolers, air washers, etc. Easy thumb screw adjustment permits raising or lowering water line as required. Capacity sizes from 1 qt. to 1½ gals. per min. Pressures up to 125 lbs.

Saddle Valves (No. 8) for ½" and ¾" iron pipe. Each consists of machined brass forgings with insert tube to fit ¼" hole, and with brass wheel handle. Needle Valves (No. 816) control water supply to humidifier and feed valves.

START CASHING-IN

ON THESE DIVIDENDS NOW!

See your jobber or write for attractive prices.

MAID-O'-MIST INC.

3213 N. Pulaski Road

Chicago 41, Illinois

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

EQUIPMENT DEVELOPMENTS

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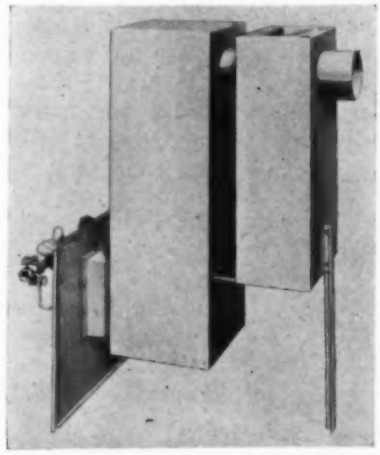

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According to an announcement in the latest news bulletin of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, the city of New Castle, Indiana, adopted the Indiana state building code in July of this year. The New Castle chamber of commerce has prepared and is now distributing copies of the city's Building Code Ordinance No. 573 which regulates the erection, construction, enlargement, alteration, repair, moving, remodeling, demolition, electricity, plumbing, heating, ventilating, and air conditioning of all public and private buildings in the city.

Provision is made in the ordinance for the creation of the office of building inspector and for issuance of permits and collections of fees for these permits. The powers, duties, and qualifications of the inspector are also defined.

The ordinance adopts Volume I, II, II and IV of the regulations and code of the Administrative Building Council of Indiana as minimum requirements.

* * *

The Indiana Association deeply regrets the passing of Charles C. McManama of Indianapolis. For the past 17 years, Mr. McManama was associated with the Indiana Machinery and Supply Company, and was always an active worker in association programs throughout the state.

Pennsylvania

The Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania, which was organized in December of last year, will hold a convention at Reading, Pa., on November 18 and 19. Headquarters will be the Berkshire Hotel in that city. The convention will feature addresses by outstanding speakers in several fields and a planned program of entertainment which promises to provide a most pleasant as well as interesting weekend.

At present, officers of the association are:

President .....A. J. Sabathne, Altoona
1st Vice President ....Walter E. Keist, Pittsburgh
2nd Vice President ..Louis Trost, Erie
3rd Vice President ...H. T. Lyons, Bethlehem
Secretary-Treasurer .E. W. Liebermann, Ambridge

Directors are C. F. Luppold, Reading; J. D. Sprucebank, Jeannette; Franklin Kottcamp, York; and A. R. Hoffman, Sharon.

NEVER BEFORE

AN AUTOMATIC HUMIDIFIER WITH THESE COMFORT-ECONOMY ADVANTAGES

MAID-O'-MIST Convector Humidifiers

Designed for fast and efficient evaporation of water, Maid-O'-Mist's narrow, individual troughs for each evaporator pad do not restrict the flow of heated air. Available in 13 different sizes, these humidifiers have evaporation capacities of 1 to 10 gallons of water per day. Made entirely of non-ferrous metal and equipped with automatic (float operated) supply valve.

60% LESS AIR RESTRICTION IN THE PLENUM—

The individual, narrow troughs have a minimum of air flow restriction which permits their use in small plenums. Result—heating efficiency, a boost to your professional reputation.

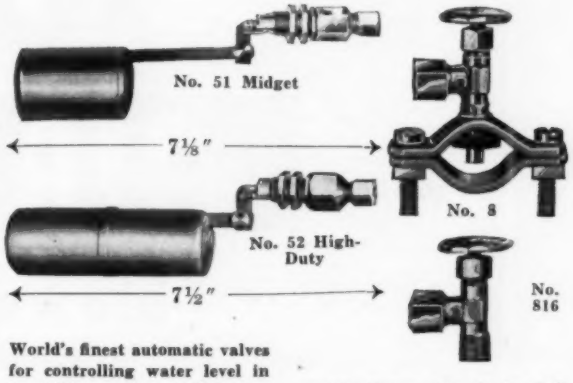
30% MORE EVAPORATING AREA—

Fast continuous humidification even at low furnace temperatures or when the thermostatic control temporarily cuts off. Result—satisfied customers, more business for you.

50% LESS INSTALLATION TIME—

You just cut out the opening in the plenum, attach the plenum flange frame, slip in the factory-assembled unit and make the water connections. A quick, easy profitable job for you.

MAID-O'-MIST BRASS FLOAT VALVES AND SADDLE VALVES FOR THAT INSIDE JOB



World's finest automatic valves for controlling water level in humidifiers, air conditioners, evaporative coolers, air washers, etc. Easy thumb screw adjustment permits raising or lowering water line as required. Capacity sizes from 1 qt. to 1½ gals. per min. Pressures up to 125 lbs.

Saddle Valves (No. 8) for ½" and ¾" iron pipe. Each consists of machined brass forgings with insert tube to fit ¼" hole, and with brass wheel handle. Needle Valves (No. 816) control water supply to humidifier and feed valves.

START CASHING-IN

ON THESE DIVIDENDS NOW!

See your jobber or write for attractive prices.

MAID-O-MIST INC.

3213 N. Pulaski Road

Chicago 41, Illinois

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

ONLY REX AIR-PAK BLOWER-FILTER HAS ALL THESE FEATURES!

Streamlined, green baked enamel casing!

Rex self-aligning rubber-mounted bearings.

Rex adjustable cut-off plate for maximum performance.

Wear-proof motor pivot.

Quiet, accurately balanced blower wheel.

Air-tight, all-welded blower housing.

Rigid outlet angle frame.

Rex transparent oil tube feed holding 5 year supply.

Leakproof filter frames.

Resilient-mounted, long hour motors—protected from overloads.

Pulleys either 4-step or variable speed.

ALL SIZES — 40,000 to 400,000 BTU per hour.

Extra heavy rigid blower renders more years of service.

FOR HARD-TO-HEAT HOMES

REX AIR-PAK

Blower-Filter

Who are your prospects? Old installations exclusively? No sir! You'll find many comparatively new coal, gas or oil gravity furnaces need Rex Air-Pak. And plenty of new gas conversion burners won't deliver even warmth until Rex Air-Pak is added. Why not tell them how Rex Air-Pak will assure *even warmth* in every room—and save up to 30% on fuel! We'll provide free literature for your mailing list . . . you'll find sales easy to close.

Write today for catalog No. 253.

Air Controls Inc

Div. of THE CLEVELAND HEATER COMPANY, 2310 Superior Avenue, Cleveland 14, Ohio

NIAGARA Gas FURNACES

Combustion chambers of cast iron or steel are included in the line of Niagara gas-fired units, both gravity models and completely automatic winter air-conditioners. Two vertical models meet the requirements for basementless homes and apartments. Vertical models are shipped as complete package units. All gas furnace cabinets attractively finished in Hammerloid enamel.

NIAGARA Coal FURNACES

Here's a really complete line of coal furnaces—round and square cased cast iron; round and square cased steel; and coal fired winter air conditioners.

NIAGARA Oil FURNACES

Completely automatic units of lasting attractiveness and dependable, economical operation with gun type pressure burners. All cabinets Hammerloid enamel.

. . . and merchandising helps

Niagara colorful folders, window signs, decalcomanias, electric signs, catalog sheets, sales portfolios, and other merchandising helps assist you in selling Niagara to your prospects.

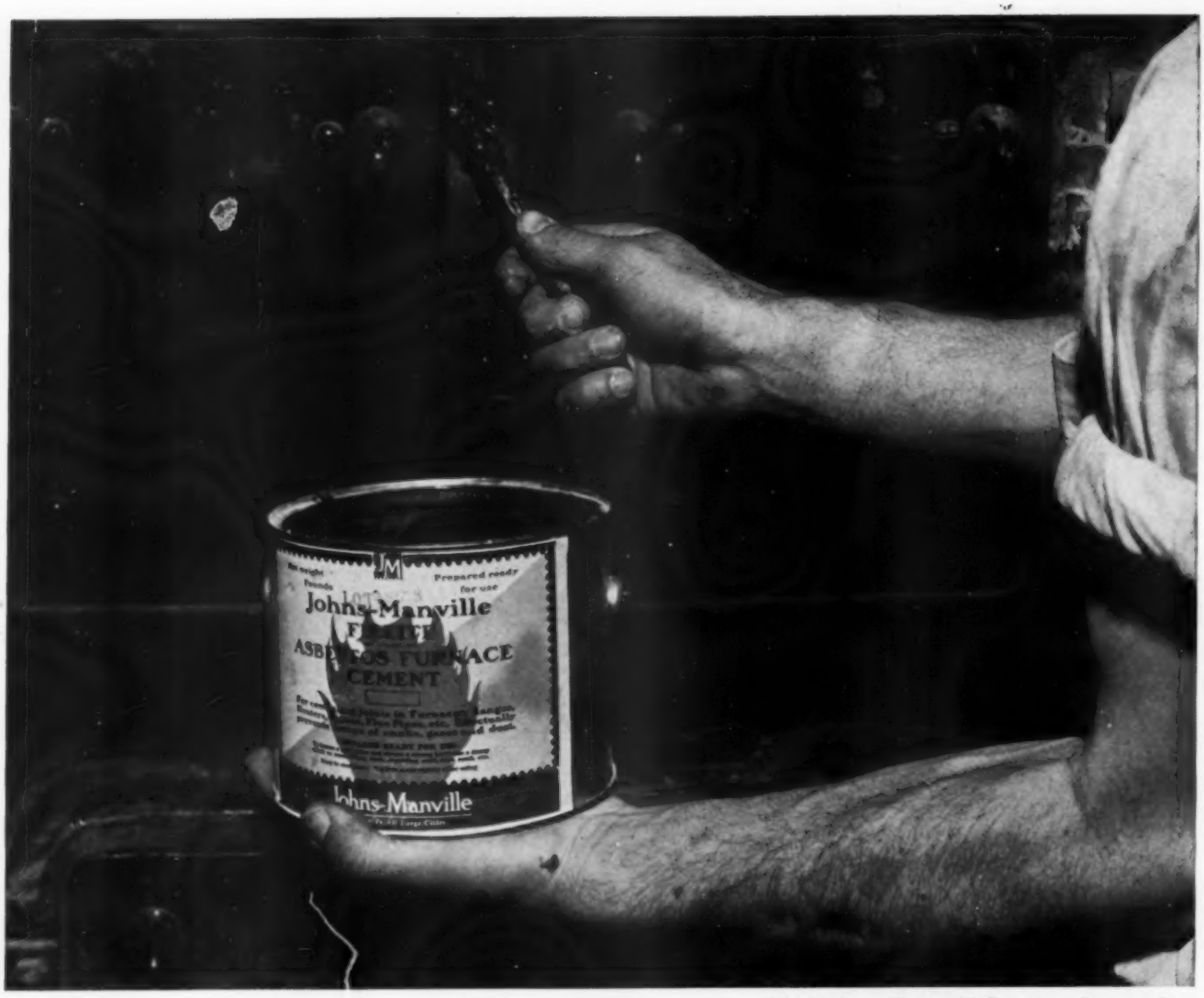
THE Niagara line is a quality line—57 years of furnace manufacturing demonstrate that the reputation of Niagara is well established.

The Niagara line is complete—gas, coal, and oil in a range of 33 sizes and models which meet any residential demand for warm air heating.

And Niagara believes that the dealer should make a profit while serving his customer with satisfactory heating at reasonable cost. Write for complete details of Niagara furnaces and Niagara merchandising helps.

NIAGARA FURNACE DIVISION
The Forest City Foundries Co.
2500 West 27th St.
Cleveland 13, Ohio

NIAGARA GRAVITY AND WINTER AIR-CONDITIONING UNITS



Fireite is easily applied to any clean surface

Joints stay *gas-tight* when sealed with J-M FIREITE*

● This easily-applied asbestos furnace cement air-sets or heat sets into a practically indestructible joint.

Fireite remains gas-tight against the highest temperatures, resists expansion and contraction strains. This is especially important for domestic oil burner and stoker installations—because better combustion results from gas-tight and air-tight joints.

Reg. U. S. Pat. Off.

Fireite Asbestos Furnace Cement is ready-mixed, ready-to-use. Easily worked, it can be applied quickly to any clean surface. Fireite is odorless. It keeps well on the bench and in the container. Fireite has minimum shrinkage, does not bloat, crumble or crack.

Use Fireite for mounting or repairing heating equipment—for setting ash pits and fire pots, doors, dampers and other places where sealing is necessary. With Fireite, there is less danger of costly call-backs for re-sealing.

WRITE FOR FREE 4 LB. SAMPLE

Let us send you a can of Fireite Furnace Cement and a copy of folder RC-7A. Simply write giving your name and the name of your company. Address Johns-Manville, Box 290, N. Y.

Johns-Manville FIREITE asbestos furnace cement

Home-Heating Dealers . . .

Your Keys to greater PROFITS!

General Motors—the key to greater value—value which is recognized by users of automotive and household appliance products the world over!

Delco-Heat—the key to customer acceptance—acceptance of Delco automatic home-heating products for their quality and dependability!

These keys will *open doors for you*—the doors of homes that recognize value—that want only the finest in automatic heat!

And these keys are emblematic of the *greater profits* that can be yours with a General Motors Delco-Heat franchise:

1. You'll be selling dependable quality products that your prospects know and trust—a name that's a household word—a name that has always been synonymous with *value*.

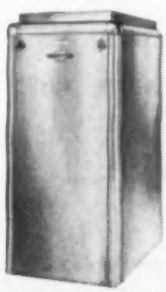
2. You'll be allied with a manufacturer whose research and engineering facilities will keep the products you sell *out in front*.

3. You'll have the help of a sales promotion program that really works—aggressive advertising and alert merchandising-helps that are geared to *meet your needs*.

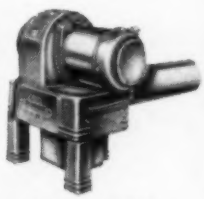
For full information concerning the many advantages of a General Motors Delco-Heat franchise, write to Delco Appliance Division, Dept. AA-10, General Motors Corp., Rochester 1, New York.

A Full Line of Automatic Heating Equipment

GENERAL MOTORS DELCO-HEAT



Oil and gas-fired Conditionairs



Conversion Oil Burners

Oil-Fired Boilers

Automatic Coal Stokers

Also manufacturers of Delco Water Systems for farms and homes — Fractional Horsepower Electric Motors — Electric Automobile Clocks.

CUT LABOR COSTS

WITH ASBESTOS-PROTECTED

DUX-SULATION

AND GAIN *Nine* IMPORTANT PERFORMANCE ADVANTAGES

It isn't often that you find a product that reduces labor costs, and yet offers marked advantages over slower, costlier methods!

That's exactly what you'll get when you insulate your duct-work with asbestos-protected DUX-SULATION. No screws, wires, lugs or bolts are needed. Every roll comes complete with a special adhesive and asbestos-protected tape for covering the corners and joints. Rolls are easy to stock and handle, being 36″ wide, ½″ and 1″ thick, and containing 100 square feet.

In addition to its cost-saving, DUX-SULATION gives "nine lives" of service: not only does it save fuel, but it prevents metallic noise, helps system-balance, and offsets overloads, reduces the power load, prevents condensation, prevents rust, absorbs sound and reduces vibration. You'll notice, too, how it improves the appearance of the duct system.

You can apply it to either the inside or the outside of round, rectangular, or irregular shaped ducts and fittings. It won't crack, chip, or buckle, and its unique flexible construction makes it superior for all types of warm air heating, air conditioning and ventilating duct work.

Ask your jobber today about asbestos-protected DUX-SULATION

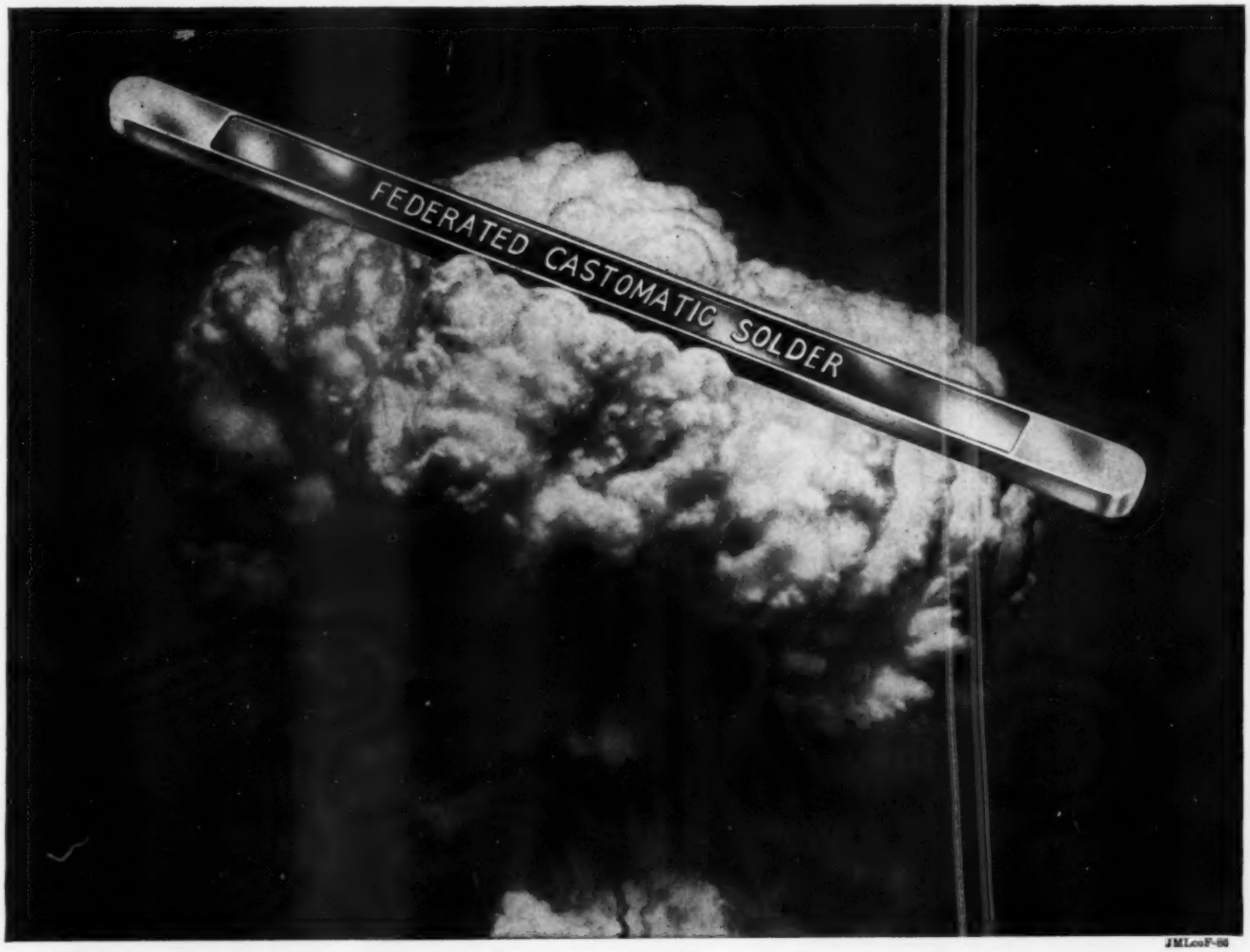
Check your duct systems now — insulate them with DUX-SULATION and gain these cost-saving and performance benefits now — and for years to come!

Write for Bulletin No. 410-A

GRANT WILSON, INC.

BOARD OF TRADE BUILDING

LASALLE at JACKSON BLVD. CHICAGO 4, ILL.



JMLeoF-50

CASTOMATIC—A *New* Power In Solder!

Federated Metals has developed and patented a modern machine which is producing an entirely NEW and BETTER bar solder . . . another Federated first!

CASTOMATIC solders are absolutely uniform. Automatic casting, with a continuous flow of metal under pressure from melting pot to mold, guarantees identical composition throughout the bar. This means that every portion of every bar melts at the same temperature; every bar gives the same results.

CASTOMATIC solders contain no harmful oxides because there is no exposure to the air during casting. This means better fluidity, easier work. The grain structure of all CASTOMATIC solders is extremely fine and free of voids. Surfaces are noticeably brighter and cleaner than hand-cast bars.

Buy CASTOMATIC now! In standard 1½ lb. bars; all commercial compositions. Call or write the nearest of Federated's 7 plants and 24 sales offices.

Federated first in the non-ferrous field AMD

Federated METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY, 120 BROADWAY, NEW YORK 5, N.Y.

now in gleaming WHITE!

THE HESS

Climate Master*

OIL FIRED UNITS

Smartly at Home in Recreation Rooms, Utility Rooms, and Modern Basements

Everybody's asking for the New Hess Climate Masters®. It'll be sales at first sight when your customers see these compact, efficient, handsome heating units . . . now available in sparkling *white* baked enamel to match other household appliances and any decorative scheme. Easy to keep clean too!

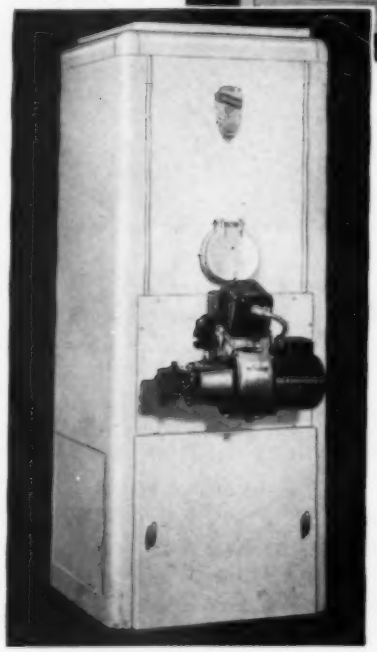
And the Climate Masters® are perfectly in step with today's trend to ranch houses and other small homes. They represent the *greatest possible warm air heating efficiency*, confined in a small, compact, handsome unit that will *fit in anywhere*.

CHECK THESE CLIMATE MASTER® ADVANTAGES:

- **Available in a size and price for every purpose.**
- **Beautiful white baked enamel finish.**
- **Compact—oil burner, controls, blower, humidifier and heat exchanger—all in one complete package!**
- **Famous Hess square design welded heat exchanger means no leakage, greatest possible direct radiant heating surface for highest heating efficiency.**
- **Burners on 80,000 units are either pressure or vaporizing type. Easily accessible for service.**
- **All heating surfaces are on pressure side of blower—no heating surfaces extend into the blower compartment.**
- **All necessary controls included. Models 80-V, 80-P and 1100 are factory assembled.**
- **Can be readily converted to gas.**
- **Model 80-V meets Commercial Standards CS104-46.**
- **Backed by Hess' 76-year experience and reputation for superiority in warm air heating.**

Write today for details on the Complete line of Hess heating equipment. Capacities up to 1,200,000 B.T.U.

SERIES D Climate Master furnished 3 sizes, from 105,000 to 175,000 B.T.U. High pressure oil burner. White baked enamel finish.



80-P Climate Master—with pressure oil burner. 80,000 B.T.U. Cabinet dimensions: 25¼" x 25¼" x 65". White baked enamel finish.

80-V Climate Master. Vaporizing burner with mechanical air supply. 80,000 B.T.U. Cabinet dimensions: 25¼" x 25¼" x 65". White or coppertone finish. (Shown in coppertone.)

The Hess Company

Furnace Sales Division—132 No. Clinton St., Chicago 6, Ill.

Factory (Cicero) CHICAGO 50, ILL.

our 76th year **Heating Experts Since 1873**

*reg. trade mark

Dust and soot can only window shop at Best & Co.

Modern New York Store Equipped with AAF Electronic Precipitators for Merchandise Protection

SHREVE, LAMB & HARMON, *Architects*
EDWARD E. ASHLEY, *Engineer*
ALVORD & SWIFT, *Contractors*

DUST and soot are department stores' most unwelcome visitors. The soilage they cause amounts to millions of dollars of loss each year in cleaning bills and mark-downs.

But their way is barred to Best & Co.'s new Manhattan store—the air conditioning system is equipped with AAF Electro-Matic* Electronic Precipitators. Dust and soot can only window shop at Best's from now on.

The benefits of clean air are not restricted to fashionable stores. A steel mill extends the life of its motors; a pharmaceutical plant protects the purity of its products; an auto body manufacturer cuts rejects in its finishing department—all with filtered air.

And only American Air Filter can meet this wide range of air cleaning requirements. Its recommendations are unbiased because its line of product is complete. Its recommendations are sound because they are based on over 25 years of successful engineering experience.

It will pay you to examine your operations as to how clean air can save you money. There's an AAF representative in your locality who will be glad to assist you in this analysis. Write today for his name and complete product information.

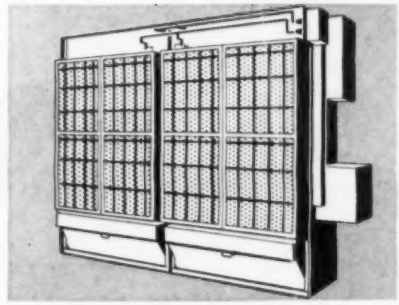
AMERICAN AIR FILTER COMPANY, INC.
355 Central Avenue, Louisville 8, Ky.
In Canada: Darling Bros., Ltd., Montreal, P. Q.

AAF

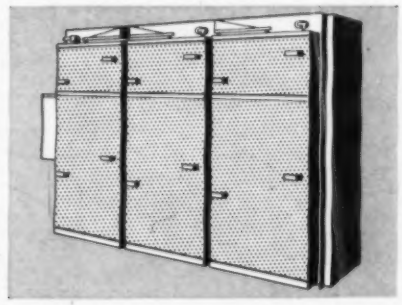
AIR FILTERS
AND ELECTRONIC PRECIPITATORS

**Automatic electronic precipitator.*

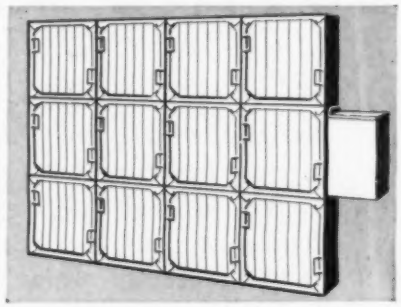
AAF OFFERS THREE DISTINCT TYPES OF ELECTRONIC PRECIPITATORS



ELECTRO-MATIC, the automatic electronic precipitator in which the self-cleaning feature simplifies maintenance and minimizes the human element as a factor of performance. Requires no sewer or water connections.



ELECTRO-CELL, with removable plate cells which permit a choice of maintenance methods—tank cleaning, manual washing in place, and automatic washing. Exclusive vertical-section construction offers advantages not found in any other "plate-type" electronic precipitator.



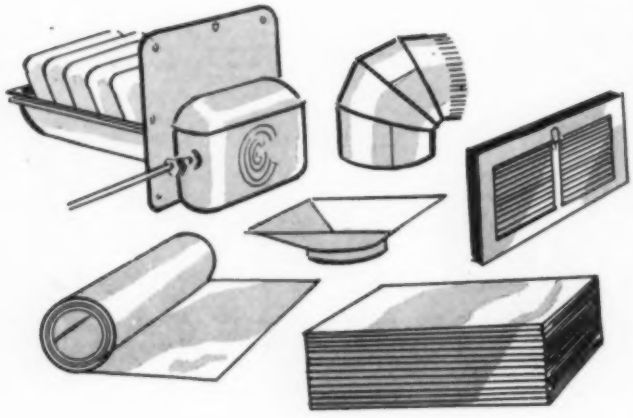
ELECTRO-PL, the dry-type electronic air filter in which the collector element is electrostatically charged Airmat paper. Combines efficient mechanical filtration with electronic air cleaning to provide complete protection against dust at all times. Maintenanced by renewing the Airmat paper.

THE ONLY COMPLETE LINE of electronic precipitators—offering three basic designs which differ in construction and method of maintenance but embody the same high-efficiency principle of cleaning air. This conforms to the established policy of the American Air Filter Company—"the right filter for the job" rather than attempting to adapt one design to the many varied requirements of modern air cleaning.

What do I expect from my fitting manufacturer?

...JUST THIS

A COMPLETE LINE



When I buy my fittings, I expect a complete line in one handy purchase. I can't afford piecemeal purchases . . . and *I don't have to.* I expect one dependable supplier to furnish my galvanized and aluminum fittings, galvanized and aluminum pipe, angles and elbows, ducts, registers, humidifiers—and aluminum sheets and coils. That's the way I expect to do business.

BUYING AT THE BEST ADVANTAGE

That's another thing. Buying a complete line means extra saving and extra profit through lower unit cost. I order mixed truckloads. That way I get the truckload discount on each and every item making up that truckload. Think of it. Less storage . . . increased dollar efficiency through smaller inventories. No LCL rates or oversized inventories for me!

That's Why I Always Buy From . . .

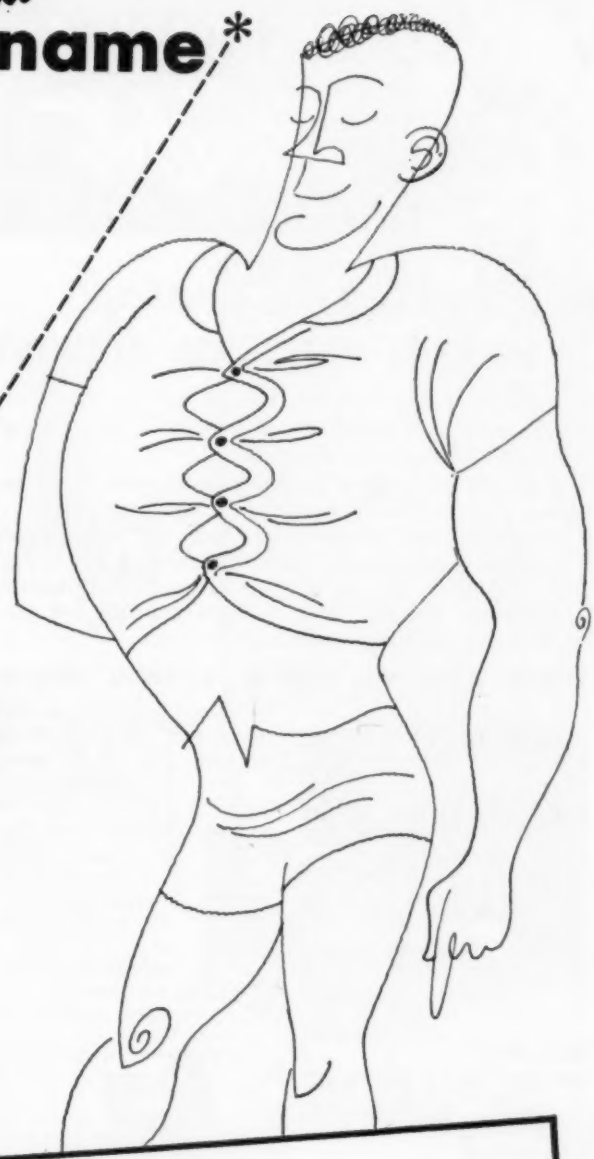
CHAR-GALE

MANUFACTURING COMPANY

MINNEAPOLIS **OMAHA**

Polyken®

...is my *new* name*



Everybody outgrows his britches sometime. I did it faster than most . . . thanks to your ever-increasing demands for Bauer & Black industrial tape.

So now I'm getting a new name . . . and clothes that fit. In other words . . . we've formed a new department with separate headquarters . . . under our own trade name . . . POLYKEN.

As new uses for industrial tapes are developed, we will continue to add specialty and standard tapes to our already broad line. And as an expanded department, we want to continue helping you in industry to cut costs . . . speed and improve methods.

Accordingly, Bauer & Black is pleased to announce that . . .

***BAUER & BLACK Industrial Adhesive Tape** will now be sold under the following trade name:

Polyken®
INDUSTRIAL TAPE

DEPARTMENT OF
BAUER & BLACK
DIVISION OF THE KENDALL COMPANY
222 W. ADAMS ST., CHICAGO 6

THERE'S A Polyken TAPE FOR YOUR JOB!
(Or if there isn't, we'll make one.)

You get COMPLETENESS AND DEPENDABILITY WITH Profit

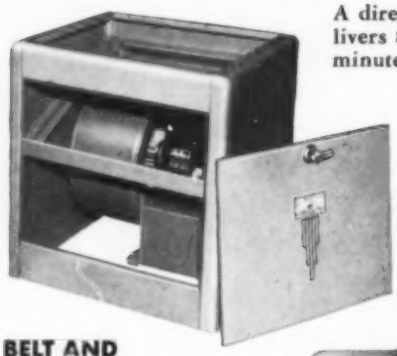
IN Peerless Electric

PACKAGE UNITS AND BLOWERS

● Peerless Electric blowers and package units are manufactured *complete* in the Peerless plant. Peerless is *not* an assembled line.

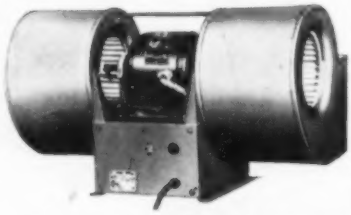
Peerless equipment is *dependable*—you minimize service worries because Peerless equipment is designed and engineered from 56 years experience in producing quality electrical apparatus. And you'll find that Peerless blowers and package units are priced right to earn a profit for you. Write for detailed information.

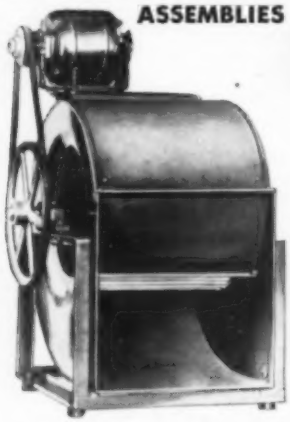
PEERLESS ELECTRIC AIRBOY BLOWER ASSEMBLY



A direct drive blower that delivers 850 cubic feet of air per minute. 3-speed blower with motor blower unit rubber cushioned. Blower wheel dynamically and statically balanced. The two motor bearings are the only bearings in the unit. Also supplied with cabinet and air filters as a complete package unit.

BELT AND DIRECT DRIVE BLOWER ASSEMBLIES





You'll find Peerless blower assemblies in many nationally-sold air conditioning furnaces of the finest quality. We furnish both of these assemblies ready to install in your own furnaces or cabinets. The many fine construction qualities of these blowers add valuable sales features to your heating units.

THE PEERLESS ELECTRIC COMPANY

ESTABLISHED 1893 • WARREN, OHIO

Peerless Electric

MOTORS • FANS • BLOWERS

NEW LITERATURE

Use Coupon on Page 109

Alloy Steel Guide 315

How to Specify and Buy Alloy Steel with Confidence, a 24 page booklet, should be of special interest to any one concerned with selecting, specifying, buying or heat treating alloy steel.

The foreword lists a number of control steps which should be taken if alloys are to be purchased and used with confidence that they will give satisfactory service. Booklet covers the control steps one by one, outlining in detail the safest methods of specifying and buying. How hazards can be minimized is discussed under such headings as How Alloys Are Selected, How to Make Sure of Getting the Right Alloy, and How to Check for Compliance with Your Specifications.

Also included is an explanation of the end-quench hardenability test, and information on standard and special types of alloy and carbon steels.

Joseph T. Ryerson & Sons., Inc., Chicago 80, Ill.

Packaged Chimney Bulletin 316

Lightweight, precast packaged chimney is described in a bulletin which presents in detail all the advantages of this type of chimney for residential construction. Package includes all accessories together with instructions for the entire installation.

According to the bulletin, the chimney is listed by Underwriters' Laboratories for use with any fuel; it meets FHA minimum requirements and conforms to National Building Code standards. The last page of the folder contains diagrams of typical installations for various types of heating plants.

The Van-Packer Corp., Field Bldg., Chicago 3, Ill.

Air Conditioner Data 317

Descriptions and illustrations of packaged air conditioners for a wide variety of applications are being offered in a series of bulletins. Units include 2, 3, 5, 7½ and 10 hp conditioners, each of which is discussed in an individual bulletin.

Each bulletin contains specifications, ratings, and dimensions of the packaged conditioner discussed.

General Electric Co., Air Conditioning Dept., Bloomfield, N. J.

Sales Manual 318

First nine sections of a 12 section retail sales manual which presents a step-by-step retail selling plan for dealer-salesmen are now available. Although intended primarily for training new salesmen, it is expected to prove useful in helping experienced salesmen brush up their sales technique.

The remaining three sections, together with supplementary reference sections, are now in preparation.

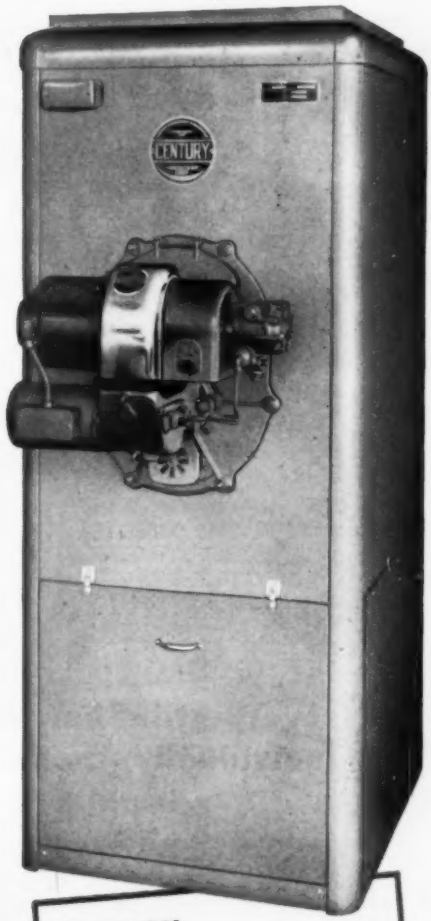
Timken Silent Automatic Div., The Timken-Detroit Axle Co., Jackson, Mich.

Super Salesmen

. . . . WITH THE PERFORMANCE-APPEAL THAT DELIVERS MORE HEATING SALES FOR YOU

CENTURY

AUTOMATIC OIL FURNACES



WINTER AIR CONDITIONERS

SIX SIZES:
105,000 TO
380,000 B. T. U.'s

LO-BOY FURNACES IN TWO POPULAR SIZES:

85,000 AND 135,000 B. T. U.'s

Yes—you enjoy a definite sales advantage when you offer your customers the *original* and *proven* features of Century Automatic Oil Heat. All Crescent units include the "Cushion-Cradled" Burner which absorbs vibration from all moving parts . . . the famous Crescent Super Heaters . . . plus new Century firing head that delivers high CO^2 and eliminates pulsation. These features add up to minimum fuel consumption! Mail the coupon below for full information about the new Century Lo-Hiboy, the new Century Winter Air Conditioners, the new Century Gas/Oil "Convertible"... and a Century franchise for your community.

NEW "CONVERTIBLE" GAS/OIL WINTER AIR CONDITIONERS

Get more sales with less inventory . . . Sell five ways with just two models. Sell Hi-boy and Lo-boy models with interchangeable gas and oil power vaporizing oil burner . . . or Lo-boy with high pressure gun type burner.

Century
ENGINEERING CORPORATION
CEDAR RAPIDS, IOWA

CENTURY ENGINEERING CORPORATION
Cedar Rapids, Iowa

Rush me information about: ☐ Lo-Hiboy; ☐ Winter Air Conditioners; ☐ "Convertibles"; ☐ Dealer franchise.

Firm Name_____

Address_____

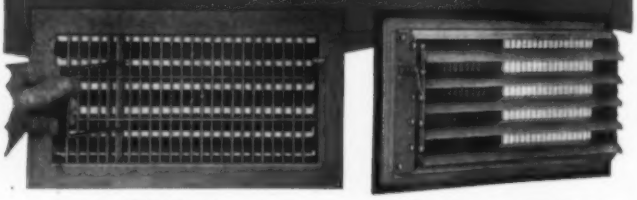
City_____ State_____

Send to Attention of Mr._____

OIL BURNERS • BOILER BURNER UNITS • WARM AIR FURNACES • HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

You can get
DIRECTED AIR FLOW
at any angle with

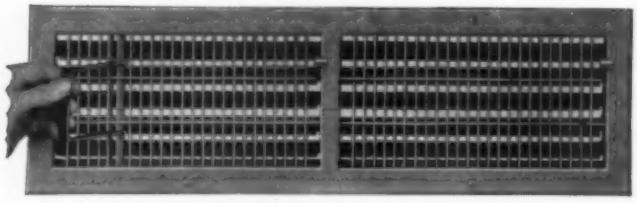
INDEPENDENT
"Fabrikated"
REG U S PAT OFFICE
AIR CONDITIONING
REGISTERS



321-A HMV

Rear View Showing "HMV" Valves

Every grille bar adjustable individually—before or after installation



321-A HMV Tandem

Any direction of air flow—right, left, up, down and any combination—is easily obtained with "Fabrikated" Style No. 321-A HMV air conditioning registers, for residence or commercial installations, on sidewalls or ceiling. The face bars are adjustable to right or left; valves on the back are adjustable to direct the air flow up or down; valves may also be fully closed, and are connected to open or close in unison.

The angles of deflection and the combinations to be had are practically unlimited. Adjustments for directed air flow may be made before or after installation. Grille bars are held firmly in place and will not vibrate or rattle.

"Fabrikated" registers are available in sizes from 8 x 4″ to 48 x 24″, including tandem style. Special sizes can be made without special die set-up charges.

Write for Catalog No. 48.

Always Leading—Always Progressing

THE INDEPENDENT
REGISTER CO.
3747 E. 93rd STREET • CLEVELAND, OHIO

NEW LITERATURE

Use Coupon on Page 109

Pipe and Fittings Catalog 319

Complete line of furnace pipe and fittings is illustrated in a 24 page catalog now available. Catalog No. 49 contains four sections devoted to furnace pipe and gravity fittings, duct and forced air fittings, stove pipe, elbows and fittings; and specialties and general information on specifying and ordering items from the manufacturer.

Acme Manufacturing Co., Philadelphia 36, Pa.

Fabricating Zincgrip 320

An illustrated 12 page booklet, entitled Fabricating and Finishing of Armco Zincgrip-Paintgrip, describes recommended methods for forming, joining, and painting this special zinc-coated and bonderized sheet steel.

Sections on storage, forming, and drawing, welding and soldering, and cleaning and painting contain helpful suggestions for shop men. Precautions and recommendations for welding and cleaning the special metal are discussed in detail.

A description of the material and of paint holding tests conducted by the National Bureau of Standards and the Bell Telephone Company laboratories are also included.

Material in the booklet is intended to help operating departments do a good fabricating job on this type of sheet steel.

Armco Steel Corp., Middletown, Ohio.

Oxyacetylene Welding Handbook 321

Welding and Cutting Manual, a new handbook on the oxyacetylene process, should be useful as a reference and instruction book for any one engaged in welding and cutting operations. The style is simple and readable, and instructions are illustrated in step-by-step photographs of actual repair jobs.

While the book is written primarily for the repairman and maintenance man, there are hints, short-cuts, and general instructive material which will help any welding operator do a better job. For example, Chapter 9 illustrates over 100 time and labor-saving articles which can be easily made. Included are detailed plans for making machinery guards, trailers, shop and kitchen stools, benches, tools, and picnic grills.

Other chapters offer short-cuts and instructions for bronze welding; fusion welding; hard-facing; cutting steel and cast iron; heating, forming, and straightening metals; welding and cutting pipe; and welding non-ferrous metals.

The appendix contains useful charts and tables, a complete glossary of welding terms, and a list of 100 repair jobs with recommended welding methods.

208 pages, 6 x 9 in., $1.80.

The Linde Air Products Co., 30 E. 42nd St., New York, N. Y.

1 plan helps prevent all 3

When you show the people in your company that you're interested in their welfare, they naturally react favorably. That's why *production goes up* when you boost your employee-participation in the Payroll Savings Plan. Here's how it happens:

The more U. S. Savings Bonds an employee holds, the more secure he feels. The more secure he feels, the greater his peace of mind—the more contented, careful, and productive he is on the job.

Those facts aren't just something we dreamed up. They're borne out in the experience of more than 20,000 companies promoting the Plan.

Everybody Benefits!

Bond sales spread the national debt, thus increasing our national economic security. And, of course, what's good for the nation is good for you and your business!

The individual Bond buyer gets back $4, when his Bonds mature, for every $3 he invested. That's a boon for him, and —multiplied by millions of Bond holders —represents a huge backlog of purchasing power that will help assure national prosperity through the years ahead.

Five Steps Boost Participation

1. See that a top management man sponsors the Plan.

2. Secure the help of the employee organizations in promoting it.

3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Payroll Savings Plan's benefits to them.

4. Make a person-to person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Nation-wide experience indicates that 50% of your employees can be persuaded to join—without high-pressure selling. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bonds Division. He is listed in your telephone directory. Wouldn't it be a good idea to call him right now, while it's on your mind?

The Treasury Department acknowledges with appreciation the publication of this message by

AMERICAN ARTISAN

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

NEW LITERATURE

Use Coupon on Page 109

Air Dryer Datagram, No. 5 322

Air Dryer Datagram SGD No. 5 deals with the application of silica gel air dryers for product drying. Bulk type drying and continuous drying are discussed at some length so that an actual problem can be followed through to arrive at a proper selection of equipment.

Flow diagrams for the bulk dryer and continuous dryer are included.

Bryant Industrial Div., Affiliated Gas Equipment, Inc., Cleveland 10, Ohio.

Registers and Grilles 323

Catalog No. 50 presents a line of registers, grilles, and scoops, illustrating each product and listing sizes and prices on all items.

One page is devoted to a new item called grille cores, designed especially for manufacturers of convector cabinets and metal or wood cabinets requiring a grille for ventilation or sound.

A four page section beginning on page 32, entitled Outlet Sizing and Engineering Data, contains information helpful to engineers, architects, designers, and contractors in planning installations. A basic price schedule for grilles and registers follows the engineering data.

Stewart Manufacturing Co., Bloomfield, N. J.

Die-Less Duplicating 324

A 40 page catalog recently issued under the title of Di-Acro System of Die-Less Duplicating covers the manufacturer's line of precision machines, including benders, shears, punch, notcher, and brakes. On page 20 and 21, announcement is made of two additions to the line—the Vari-O-Speed and Standard power shears.

Featured in the catalog is an explanation of dieless duplicating technique as well as a history of the origin of the system.

O'Neil-Irwin Mfg. Co., 394 Eighth Ave., Lake City, Minn.

Oil Burner Accessory 325

Sales aid literature directed to oil burner salesmen outlines the advantages of selling the whistling tank fill signal, Ventalarm, as an added-interest accessory for oil burner prospects.

Foremost among the advantages which Ventalarm offers to the homeowner is the freedom which it provides from fuel oil delivery problems. Installation of the signal enables oil deliveries to be made from outside with no need for the service man to enter the house to check tank capacity. Deliveries can therefore be made even in the absence of the homeowner.

Scully Signal Co., 88 First St., Cambridge, Mass.

The Customer Always Returns
General FUEL OIL FILTER
DE LUXE MODEL
2A-300
Model 2A-300 for exceptionally dirty tanks and large furnaces and boilers. 9-1/16" high; 5-1/2" diameter; 3/8" pipe openings.
General FUEL OIL FILTER
STANDARD MODEL
1A-25
Model 1A-25 for space heaters, hot water heaters and small furnaces. 4-3/4" high; 3-1/2" diameter. Same style but with double capacity available as Model 2A-700.
FOR YOUR PASSENGER CAR OR TRUCK
General Filters are now available for your car or truck. Cartridges changed in one minute without tools. Complete kits include brackets for either engine or dash mounting. Put one on your car and truck. Regular dealer discounts.
You can be sure of repeaters when you sell a General Filter because the customer is always pleased with his money saving investment. So pleased, that it is natural for him to return year after year for a new cartridge. And your profit doesn't stop at the initial sale; it goes on and on with only a minimum of service from you.
A General Filter on every fuel oil burning installation is a good deal for both you and your customer — you make a nice profit on every sale and your customer is saved annoyance and expense from clogged burners.
MORE THAN 1600 JOBBERS TO SERVE YOU
GENERAL FUEL OIL FILTER

NOW . . .

a TRULY Forced Air

INN-A-WALL

. . . and you can employ duct work where necessary!

● Yes, sir . . . here is *the* answer to heating properly small homes without basements. Security's INN-A-WALL is an entirely new principle in forced air heating! Requires minimum duct work . . . may be used without ducts. Needs only 16 by 20-inch floor area.

The INN-A-WALL reverses the usual flow pattern . . . warm air comes out the *bottom*. This means *warm floors!* Warm air can be taken from all four sides . . . return air, from all sides at the top. Where ducts are required for distant rooms, permanent connection is made at the bottom. Completely assembled . . . ready to install. Casing height, 88 inches. Security breather tube automatically supplies air for combustion.

Other outstanding INN-A-WALL values are • Quiet, positive blower • Fully automatic • Special Security high-efficiency burners • Complete adaptability to any floor plan (may be placed in wall or stand alone) • Amazingly economical in price.

SECURITY

Automatic, Gas-Fired

INN-A-WALL FURNACE

Write Today . . .

don't delay. Get all the facts about this revolutionary new furnace.

SECURITY MANUFACTURING CO.

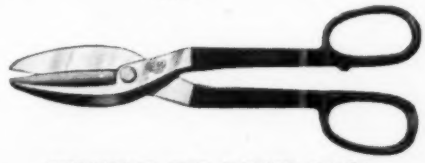
1630 Oakland St. Kansas City 3, Mo.

Good craftsmen are better with WISS Metal Snips!

WISS METAL-MASTER COMPOUND ACTION SNIPS

Compound leverage produces amazing cutting power with minimum effort. Set of 3 snips handles intricate jobs involving inside holes, circles, complicated patterns. Rubber grips recommended.

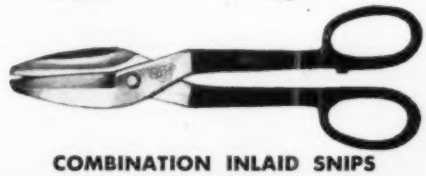
NO.	OVERALL LENGTH	LENGTH OF CUT	WT. EA.
M-1 (Cuts Left)	10 in.	1⅜ in.	12 ozs.
M-2 (Cuts Right)	10 in.	1⅜ in.	12 ozs.
M-3 (Cuts Straight and Curves)	10½ in.	2 in.	12 ozs.



STRAIGHT CUT INLAID SNIPS

Crucible steel inlaid blades. The basic snips for straight metal cutting. Gunmetal handles.

NO.	OVERALL LENGTH	LENGTH OF CUT	AV. WT. EA.
10	11½ in.	2½ in.	1½ lbs.
9	12½ in.	3 in.	2 lbs.
8	13¾ in.	3½ in.	2½ lbs.
7	14½ in.	4 in.	3 lbs.
6½	15¾ in.	4½ in.	3⅞ lbs.



COMBINATION INLAID SNIPS

Crucible steel inlaid blades. Straight blades, but ground and shaped so they cut curves, irregular shapes, or straight. The first choice of many sheet metal workers.

NO.	OVERALL LENGTH	LENGTH OF CUT	AV. WT. EA.
19	12½ in.	3 in.	1⅞ lbs.
18	13½ in.	3½ in.	2⅜ lbs.
17	14½ in.	4 in.	2⅞ lbs.

BULLDOG HEAVY-DUTY INLAID SNIPS

For cutting monel metal, stainless steel, Allegheny metal and all tough alloys. Invaluable for bench work in cutting strap iron bands. Cuts 18-gauge galvanized iron.

NO.	NAME	OVERALL LENGTH	LENGTH OF CUT	AV. WT. EA.
5	Bulldog	17 in.	2½ in.	3⅞ lbs.

BULLDOG COMBINATION STEEL SNIPS (not illustrated)

Moderately priced solid steel combination pattern for heavy duty work. Cuts curves and irregular shapes in the heavier metals. Short, powerful jaws and long handles give extra leverage.

NO.	OVERALL LENGTH	LENGTH OF CUT	WT. EA.
A-16	16 in.	3 in.	3¾ lbs.

Send for catalogue of complete line of metal cutting snips. 10 patterns, 24 sizes.

J. WISS & SONS CO.

Newark 7, N. J.

New Sheet Metal Tool

by

VISE-GRIP

Everywhere, sheet metal men are saying the new VISE-GRIP Sheet Metal Tool is just what they want! It has many advantages:

- **LOCKS to work with powerful non-slip grip**
- **Therefore, does more perfect forming**
- **Eliminates tiresome hand-gripping**
- **Adjustable to non-locking action**
- **Has extra deep throat**

Double-lever action not only exerts tremendous jaw pressure but LOCKS jaws to the work. Even when adjusted for non-locking action, a light hand-grasp exerts tremendous pressure on the jaws. Nickel plated. 8" long.

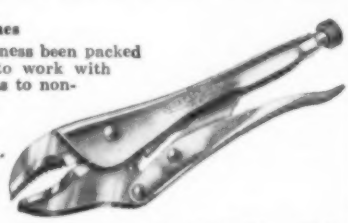
WIDELY ADAPTABLE

Most useful hand tool ever developed for bending, forming, seaming, crimping or straightening sheet metal. For holding templates, holding sheet metal for welding, working inside stacks, bending lead, etc.

Order VISE-GRIP Sheet Metal Tools from your supplier. If he doesn't have them yet, order direct. **Only $2.95 each.** Guaranteed.

VISE-GRIP Wrenches

Never before has so much usefulness been packed into a single hand tool! Locks to work with Ton-Grip. Easily released. Adjusts to non-locking action.



No. 7W, 7" with cutter, $2.25
No. 10W, 10" " " 2.50
No. 7C, 7" without cutter, 1.85
No. 10C, 10" " " 2.25

PETERSEN MFG. CO. Dept. AA-10, DeWitt, Nebr.

WITH THE CONTRACTORS

CLIMATE CONTROL ENGINEERING CORPORATION, specializing in air conditioning equipment, recently began operations at 4225 Touro St., New Orleans, Louisiana.

Partners in the new firm are Mrs. Helen Skerrett, John Cone, and Malcolm Rebennack. Mrs. Skerrett has announced that Climate Control plans an intensive educational campaign to inform the public of the importance of air conditioning for *Indoor Comfort.*

THE FAHNLE & DIETRICH COMPANY, now located at 4203 Coleraine Avenue, N., Cincinnati 23, Ohio, have published a brochure commemorating the 50th anniversary of their founding in 1899.

In an attractive manner, the brochure sketches the history of the firm which began in a 15 by 30 ft storeroom at Oliver and Linn streets. In 1902, the company moved to larger quarters at 537 Oliver St. By the year 1914, the firm was doing such a flourishing business that two motor trucks were purchased for speedier transportation of materials. This move made Fahnle & Dietrich one of the first sheet metal and roofing contractor firms in Cincinnati to use motorized equipment.

The building which the firm now occupies was purchased in 1948 and in these larger quarters the company engages in manufacture of stainless steel and aluminum specialties and the installation of forced warm air heating and ventilating systems for residences and offices. The plant is now one of the most modern of its kind in Greater Cincinnati.

FISHER ROOFING COMPANY, Scottsbluff, Nebraska, is proud of the part they are playing in building Terrytown, Nebraska's newest town.

P. E. Fisher writes that they have received the contract for roofing, heating, and metal work on 12 four-dwelling units and 20 houses, to be followed later by 22 more homes. All are FHA approved.

Builder and owner of Terrytown is Terry Carpenter, who has served as lieutenant governor of Nebraska and as mayor of Scottsbluff.

The Fisher Roofing Company has been serving the western Nebraska area for 12 years. They have recently become franchised fabricators of storm windows and doors, and as a result, they expect to move the firm to new and larger quarters in the near future.

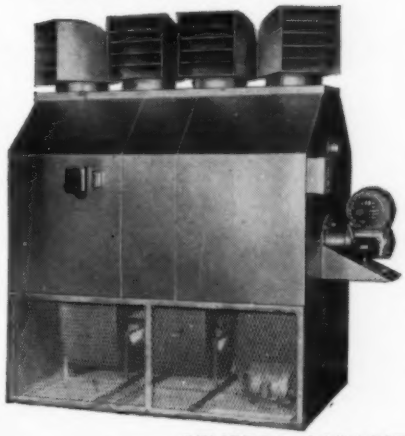
NATIONAL CHAMPION

GAS and OIL BURNING

NATIONAL HEATER COAL FIRED FORCED AIR UNIT

Specifically constructed and designed for stoker and hand firing with blower position at rear or side of casing, this unit embodies all the features of other NATIONAL heaters for greater satisfaction and economy of operation. Can be quickly and efficiently converted to light oil, heavy oil or gas firing as future fuel costs and supplies may necessitate.

DIRECT FIRED UNIT

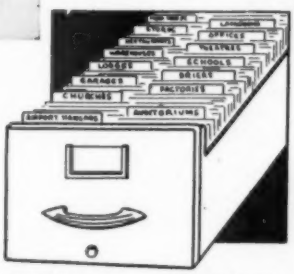


HEAVY DUTY FORCED AIR UNITS FOR LARGE SPACE HEATING REQUIREMENTS

A self-contained unit with adjustable discharge heads for positive heat delivery in any direction. Streamlined fire box of high heat and corrosion resisting Type 310 Stainless Steel insures a far longer life of service and satisfaction. Tear Drop combustion chamber design and convector tube arrangement affords complete efficient air wipage of all heating surface at minimum resistance. Available in models for central heating systems employing supply and return ducts.

WIDE RANGE OF APPLICATIONS

These units have proven practical and economical for most types of public, commercial and industrial buildings. National Champion heaters are the product of over a half century of experience in this field and the latest advanced engineering features of these units have been tested in a rapidly increasing range of actual installations.



Write for Literature

GENERAL CAPACITY DATA
OIL & GAS FIRED HEATER

Model Number	Btu	Cfm	hp	Dimensions (inches) length-width-height			Approximate Shipping Weight
T. D.— 25	250,000	3,600	¾	60	32	81	1,300 Lbs.
T. D.— 40	400,000	5,400	1	60	32	81	1,350 Lbs.
T. D.— 50	500,000	6,600	1½	80	32	81	1,780 Lbs.
T. D.— 70	750,000	8,800	2	80	32	81	1,855 Lbs.
T. D.— 80	800,000	10,200	3	80	48	81	2,110 Lbs.
T. D.—100	1,000,000	12,500	5	80	48	81	2,200 Lbs.
T. D.—125	1,250,000	15,300	5	100	54	103	3,000 Lbs.
T. D.—150	1,500,000	19,400	7½	100	54	103	3,250 Lbs.

NATIONAL HEATER CO. • CLEORA & VANDALIA STS. • **ST. PAUL, MINN.**

for trouble-free service . . .

Randall self-lubricating self-aligning pillow blocks

Write for Catalog 49, with complete information on exclusive Randall design features, data on new, low cost models and revised specifications.

Streamlined One-Piece Steel Housing Pillow Block

Randall Graphite Bearings, Inc.

609 West Lake Street, Dept. 1011, Chicago 6, Illinois

SALES SENSE

By JACK BEDFORD

There are two kinds of discontent in the world: (1) the kind that works, and (2) the kind that worries. One adds to the commission check and the other robs a salesman of his most valuable asset—peace of mind.

Dealers who follow the horses usually find that the horses they follow follow other horses.

Sales Manager: You young fellows expect too much today. I'll bet you don't know what I was getting when I was married.
Smart Salesman: No, and I'll bet you didn't either.

Castles in the air are all right for business men until they try to move into them.

Seasoned salesman reported the other day that you can thaw out many a cool reception with a warm smile. Might try it some time when the going gets a little tough.

Worry is the interest salesmen pay on trouble before it arrives.

Salesman: (to wife) If you don't stop nagging me I'm going to tell you a few things.
Wife: Fine! Begin by telling me why you called me "Baby" in your sleep last night.

There are two ways to get success: Work for it or gamble for it. Odds are best on the first way . . . work.

Sales Manager: There's a fellow who's going places.
Secretary: Ambitious fellow is he?
Sales Manager: No, his wife is out of town.

What this country needs is not a good five cent cigar, but to settle down and settle up.

Reformers are people who were never permitted to poke the fire when they were young was the definition given by the salesman's sage.

Salesmen who want their dreams to come true will have to wake up . . . . . tomorrow may be too late.

Some salesmen have the happy faculty of taking twenty minutes longer to say what they think than to tell what they know.

Horse sense, according to a veteran dealer, is a mental quality horses have that keeps them from betting on people.

One reason so many salesmen don't recognize opportunity when they meet it is that it usually goes around in common dress and looks like hard work.

Sales Sense is Common Sense that keeps salesmen betting on themselves and their ability to sell . . . and the number of tickets cashed on this type of betting is the best of any sport.

Announcing a **NEW** *Johnson Burner in the* **low-price field...**

The **ECONOMAT**

Now for the first time, the makers of world famous Johnson Oil Burners have entered the lower price field with an automatic pressure-type burner which outperforms many heating units that cost twice as much.

With this super-efficient new unit you can meet virtually any price competition. In the Economat you have a burner that offers every good feature of modern burner design: automatic controls, high efficiency, fuel economy, streamlined modelling . . . all this plus the prestige of one of the oldest names in the oil-burner industry.

The Economat operates on low priced oils as heavy as CS 12-48 No. 2 or "Pacific Coast Specif. No. 200" at firing rates ranging from .75 g.p.h. to 2.25 g.p.h. It burns with a "soft" flame that is quiet, clean and complete . . . and exceptionally economical.

If you're faced with "price competition headaches" it will pay you to investigate the Economat quickly. See your nearest Johnson dealer or write to us direct.

COMPLETELY AUTOMATIC! SAFE! DEPENDABLE!

Plenty of Power for any ordinary sized home!

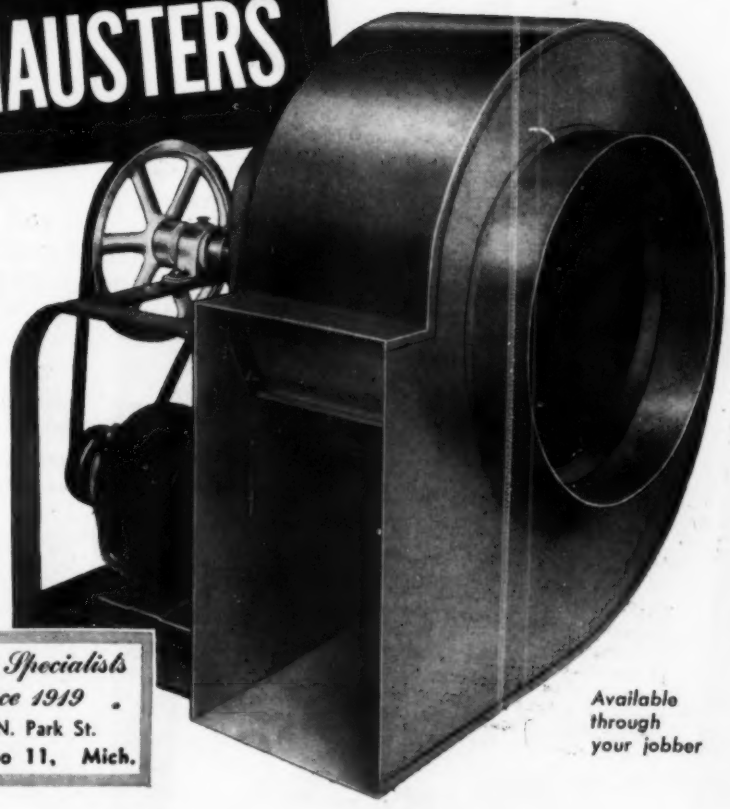
EASY TO SELL!
EASY TO INSTALL!
EASY TO SERVICE!

Johnson Oil Burners

S. T. JOHNSON CO.
940 Arlington Ave., Oakland 8, Calif.
401 No. Broad St., Philadelphia 8, Pa.

Builders of fine Oil Burner Equipment since 1903

Brundage EXHAUSTERS



• HIGHER STATIC PRESSURE • FASTER AIR REMOVAL
• EXTREMELY VERSATILE • QUIET OPERATION

Brundage Exhausters are mass produced in eleven sizes to cover a complete range of performance requirements. Each model is available in sixteen different discharge angles. For your next ventilation job specify a precision built, yet economically priced, Brundage exhauster unit.

WRITE FOR LITERATURE

Brundage COMPANY

Blower Specialists Since 1919
614 N. Park St.
Kalamazoo 11, Mich.

Available through your jobber

ANNOUNCING THE NEW **PEERLESS**

Thermejector STEEL FURNACES

This is our golden anniversary—and we are making it your *golden opportunity* to sell more furnaces and more satisfaction than you have ever sold before!

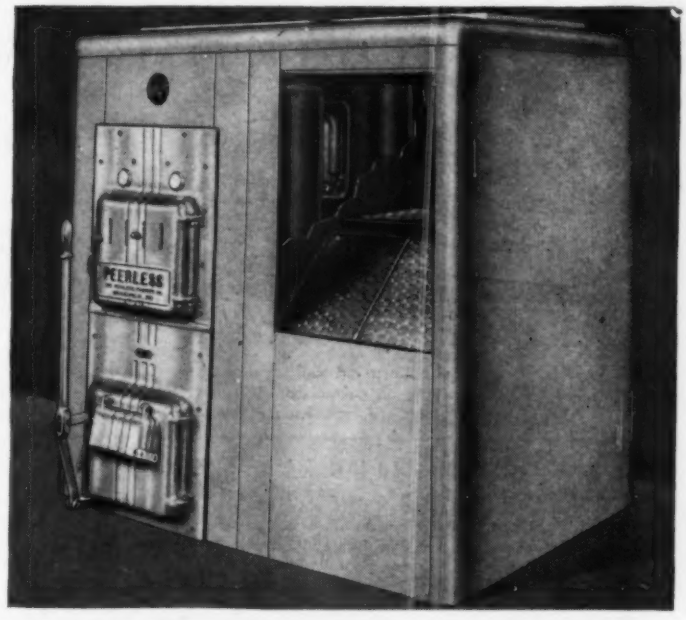
Pictured here is the new square-cased PEERLESS steel furnace, combining the super-efficient "*Thermejector*" combustion principle with inverted V-baffle and the powerful, silent PEERLESS blower—all in one beautiful streamlined cabinet. Then there is a similar unit with fuel-saving, easy firing, 3-way direct draft damper that prevents smoking and puffing; a model with each baffle, but without blower for straight gravity heating; and a money-saving round-cased furnace operating on each principle, for equal efficiency but lower cost. All of these extra-value furnaces are real fuel-savers, using coal, oil or gas.

Write today for NEW sales literature and let PEERLESS help make this your biggest year, for sales and profits!

PEERLESS FOUNDRY COMPANY

Pioneers in warm air heating for half a century

INDIANAPOLIS 7, INDIANA



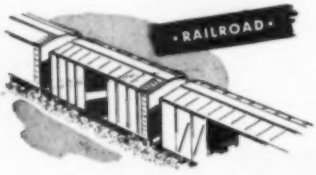
Leader of the Peerless line for '49! Model G-SF Peerless "Thermejector" forced air furnace, with famous inverted V-baffle.

here's how
ZINC
SERVES YOU

Galvanizing (Zinc coating) insures long-time, low-cost service . . . protects property . . . saves money. For as long as iron or steel is coated with Zinc, *it cannot rust!* For satisfaction, use galvanized materials . . . they're "Sealed-in-Zinc" against rust.

ZINC INSTITUTE 2 oz. COATING SEAL OF QUALITY

TIME proves galvanized sheets stay stronger longer. Used as roofing and siding, they give buildings the "strength of steel" . . . the rust protection of Zinc. The "Seal of Quality" (above) is your guide to economy in buying galvanized sheets. It means they carry at least 2 oz. of Zinc per sq. ft. Galvanizing also lengthens fence life and service.



Galvanized products in railroad industry guard bridges, buildings, cars., etc., against rust.

Strength, workability and resistance to heat as well as rust, make galvanized sheets ideal for heating and air-conditioning.

FREE BOOKLETS

Fully illustrated and packed with practical information on galvanized sheets and Metallic Zinc Paint. Send for these *free* booklets, *today!*

AMERICAN ZINC INSTITUTE
35 East Wacker Drive, Chicago 1, Ill. Rm 2614

Send me without cost or obligation the illustrated booklets I have checked.
- ☐ Repair Manual on Galvanized Roofing and Siding
- ☐ Facts about Galvanized Sheets
- ☐ Use of Metallic Zinc Paint to Protect Metal Surfaces

Name_____

Address_____

Town_____ State_____

INDUSTRY ITEMS

A. E. Hess has announced his resignation as managing director of the Oil-Heat Institute of America effective October 1. He will join the Marketing and Distribution Division of the Lustron Corporation, Columbus, Ohio, immediately in an executive capacity.

Well known in the heating industry, Mr. Hess has supervised OHI activities for the past five years. Some of the heating industry's greatest advances came about during this period.

The Combustioneer annual summer sales meeting was recently held at the plant in Springfield, Ohio. District managers from all over the United States and company executives were in attendance. The meeting was conducted by M. E. McCampbell, sales manager.

Combusticneer Meeting

An advertising program for 1949 was outlined by C. L. Brooks, sales promotion manager, together with a new series of newspaper mats and a new type of distributor advertising agreement. New literature on the Combustioneer humidifier was also presented.

Edward A. Wilson, Jr., formerly director of jobbing sales for Skuttle Mfg. Co., 4099 Beaufait St., Detroit, Michigan, has recently been appointed assistant sales manager. Mr. Wilson is well known throughout the industry for his position has required intensive traveling.

Friends, Associates and Fellow Merchants recently honored Griffith G. Jones on the celebration of the 60th anniversary of his continuous association with Mohr-Jones Hardware Co., Racine, Wisconsin. He now heads the firm as president and treasurer.

Mr. Jones began work as a tinsmith apprentice in 1889 for Jacob Mohr and remained with the firm through the many years since as it has risen to a position as one of the leading businesses in Racine.

The firm's 25 Year Club presented Mr. Jones with a sterling silver service at the testimonial dinner which was held in the Hotel Racine.

"SUPER SAW PAID FOR ITSELF IN TWO DAYS"

AIR COOLED

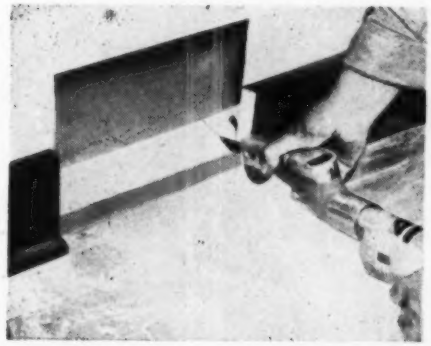
PATS. PEND.

—that's what a user told us, and we believe it because—at its low cost—SUPER-SAW is a real "buy". It is built to last a lifetime, and has these exclusive advantages:

1. Blower, a built-in feature, removes sawdust and chips and enables SUPER-SAW to "Cut in a breeze."

2. SUPER-SAW has replaceable bearings.

3. SUPER-SAW is steady. It has no torque or annoying spin.



SUPER-SAW made this opening for wall register in jig time.

SUPER-SAW is sold by better dealers everywhere and blades for almost every purpose may be obtained from them. Write us for FREE ILLUSTRATED BROCHURE.

RCS TOOL SALES CORPORATION

Chalstrom Building . . . . . Joliet, Illinois

Equip with THERMO DRIP

FOOL PROOF AUTOMATIC HUMIDIFIER THAT LASTS LONGER

Thermo-Drip Humidifiers are made to give you years of trouble-free performance. Even with hardest water, Thermo-Drip stands the test with long life and few replacements.

Thermo-Drip pans are stainless steel, rust-resistant, corrosion-proof. This thin bare metal pan with only a thin film of water gives greater humidifying efficiency by heating and vaporizing the water much faster.

Thermo-Drip Humidifiers are the *adjustable* humidifier. An outside fingertip control gives every user precisely the amount of humidity desired.

These extra features are built into every Thermo-Drip Humidifier

- Drip Feed Principle creates balanced atmosphere
- Hot pan surface gives immediate vaporization.
- No stagnant pool of water stands in pan
- Fingertip adjustment for more or less humidity
- Easy to clean
- No electrolytic action
- Valve movements prevent clogging by lime
- Easy to install — fits all types of warm air furnaces

Write today for Free Catalog, Dept. A-99

AUTOMATIC HUMIDIFIER CO.

CEDAR FALLS, IOWA

with ARMSTRONG heating equipment

COMPLETE LINE

To be a leader in warm air heating, you must have a unit for every need or preference—any style, any size, for any fuel. Armstrong offers you a *complete* line—37 models and sizes of coal furnaces, 10 gas furnaces, 7 oil furnaces—in addition to oil burners and gas conversion burners.

MERCHANDISING ASSISTANCE

Armstrong helps you lead in sales. The Armstrong merchandising program includes all types of selling aids, from direct mail to radio, from newspaper publicity to house-to-house canvassing, with attractive bulletins to assist in closing sales.

PROMPT DELIVERY

To maintain sales leadership you must be able to depend upon prompt delivery, and prompt delivery depends to a large extent upon production capacity. Armstrong has up-to-the-minute manufacturing plants in Columbus, Ohio and Des Moines, Iowa to provide quick handling of your orders. The Armstrong plant in Columbus is the world's largest factory devoted exclusively to the manufacture of warm air heating equipment.

CUSTOMER SATISFACTION

Satisfied customers are your best claim to leadership. That's why Armstrong maintains large design, development, and factory engineering departments to build years of trouble-free service into every Armstrong furnace. An Armstrong customer is a satisfied customer—that's why Armstrong jobbers and dealers are the leaders in their trade.

MAIL THIS COUPON NOW

for information about an Armstrong connection in your territory.

___ I am a wholesaler. Send me information about Armstrong Selective Distribution.

___ I am a retail dealer. Send me the name of the Armstrong jobber in my vicinity.

Firm Name_____

Street Address_____

City, State_____

ARMSTRONG FURNACE COMPANY

COLUMBUS, OHIO — DES MOINES, IOWA

As a service to jobbers and dealers, Viking Air Conditioning Corporation, Cleveland, Ohio, has recently established a new dealer contact department. The object of this new department is to aid both jobbers and dealers by contacting heating dealers through their jobbers.

Richard F. Gang heads the dealer department, and is now developing a program which will completely cover all phases of dealer operations connected with blower package uses, installation information, sales aids, merchandising and display.

He will work directly with heating dealers through their jobbers. This procedure will enable Viking to keep both jobbers and dealers informed on any new developments in the blower package field or the merchandising and display of them.

The new department is now making surveys in Cleveland and working on programs to assist dealers in their promotion and sales. After these surveys are completed and the results are compiled, Mr. Gang and his department will personally contact dealers throughout the country working with them and offering merchandising and promotion aids.

R. A. Dooley

R. F. Gang

R. A. Dooley has been appointed division manager east of the Rockies for the Coroaire Heater Corporation, according to an announcement by A. W. Conley, president.

Before joining Coroaire Mr. Dooley was associated with the Addressograph-Multigraph Corporation, Cleveland, Ohio. During his twelve years with that firm he carried out many national distribution and sales management assignments successfully. One of his first objectives in his new position will be to solidify Coroaire's distributor and dealer organizations by expansion in the areas now supplied with natural gas for the first time.

In connection with this program three new distributors have been announced for Coroaire products: Forster Distributing Co., Minneapolis, Minnesota, Clayton Distributing Co., Dallas, Texas and Peninsular Distributing Co., Detroit, Michigan.

Alabama Metal Lath Company, Birmingham, Alabama has started production of galvanized steel rain carrying products, according to an announcement by Frank Horton, president. A full line of equipment will be manufactured including gutters, conductor pipe and all fittings and accessories.

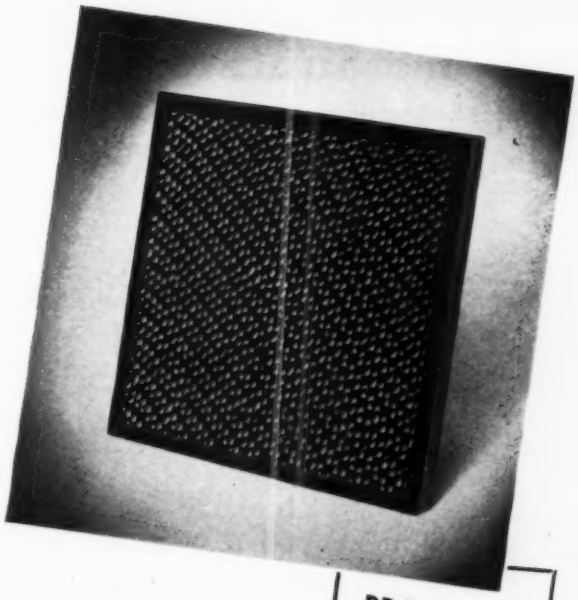
These products will be made of galvanized steel unless otherwise specified. On special order, they can be obtained in 16 oz copper.

Sell the
DETROIT
air filter

with WICK-ACTION

TO SECURE SATISFIED CUSTOMERS

With "Wick-Action" the passageways through the filter are kept open, therefore more air is allowed to flow through the filter which gives more efficient operation of any air conditioning unit.



PROVE IT!
. . . test a
WICK-ACTION
filter yourself

DETROIT AIR FILTER CO., INC.
P. O. Box 407 Woodstock, Illinois

Write today for literature

You'll Sell Your Customers More When You
Sell Them Clipper

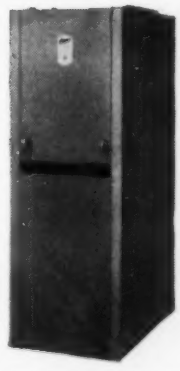
Here is a typical Clipper air-conditioning furnace with front panels removed to show easy accessibility of controls, blower and burner equipment.

Not only do Clipper automatic gas-fired furnaces with the Multi-Stream Heat Exchanger offer efficient economical heating, but also modern air conditioning for the greatest living comfort.

COMPLETE RANGE OF SIZES. Clipper furnaces are built in a range of sizes from 80,000 to 200,000 BTU.

COMPETITIVE PRICES. Despite their fine engineering, heavy gauge metals, highly improved controls and other features, Clipper gas-fired furnaces are priced in competition with ordinary furnaces.

IMMEDIATE SHIPMENT. Due to the size of the Henderson plant, equipped with the most modern machinery and to the fact that the plant is located in one of California's most productive climates where steady home-owning mechanics are available, we are able to give you immediate shipment of any model.



Compact, with baked enamel finish, the Clipper is attractive for installation anywhere. Clipper units are easily installed even in a small closet. *All Clipper furnaces, regardless of size, are shipped to you completely assembled, completely wired and individually tested at the factory.*

You'll Find the Clipper Enables You to Sell More—For complete information on Clipper gas-fired units and also on the details of a profitable sales representation plan, fill out and mail this coupon.

HENDERSON FURNACE AND MFG. CO.
SEBASTOPOL, CALIFORNIA

Henderson Furnace and Manufacturing Co.
Sebastopol, California

I am interested in the sales opportunities of Clipper furnaces. Please send me complete information.

*Name*_____

*Address*_____

*City*_____ *State*_____

if you manufacture...

- space heating units
- air conditioning equipment
- oil burners
- stokers
- gas heating units
- humidifiers

you'll want to buy...

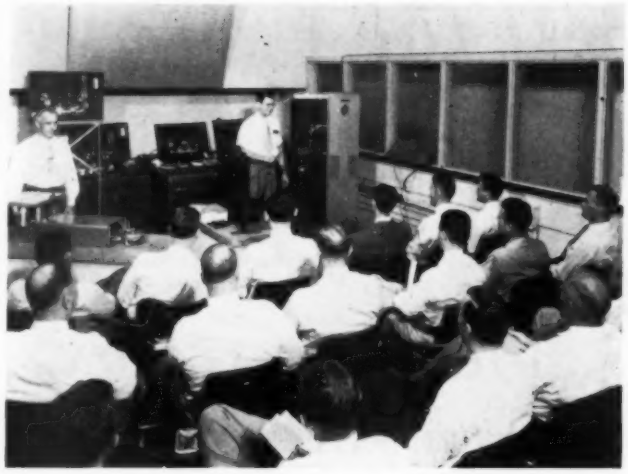
NATIONAL LOCK HARDWARE

"all from 1 source"

- simplified purchasing
- complete selection
- simplified control
- lower shipping costs
- uniform high quality
- prompt delivery

write us for full information

NATIONAL LOCK COMPANY
Rockford, Illinois



Bryant Service School

TO KEEP ITS DISTRIBUTOR-DEALER ORGANIZATION informed as to the newest developments in product design and service, Bryant Heater Division recently conducted the first of a continuing series of service schools at its headquarters in Cleveland, Ohio.

A capacity group was in attendance at the first session, which dealt with the fundamentals of heating, analysis of gases, adjustment and servicing of heating controls, and servicing and installation of Bryant equipment. Together with the above-named subjects, explanations of dual-fuel operation, quality control, and volume water heating concluded the major items covered during the three-day meeting.

WHITE-RODGERS ELECTRIC COMPANY, makers of automatic controls for heating, air conditioning and refrigeration, has announced the opening of a new branch office at 3-219 General Motors Building, Detroit, Michigan, which will service Detroit and surrounding area.

Charles M. O'Brien is Detroit district manager. White-Rodgers with home offices at St. Louis also maintains branch offices in New York and Chicago with resident sales engineers in principal cities.

T. A. CRAWFORD, general manager of the Timken Silent Automatic Division, of Jackson, Michigan, announces the appointment of Gaylord W. Schultz as middle west regional manager and James H. Eldridge as district sales manager.

Mr. Schultz has been in the heating business since 1936. During World War II he served as an administrative inspector in the Air Forces. He will make his headquarters in Kenosha, Wisconsin, and will be responsible for the Northwest region.

Also in the heating business since 1936, Mr. Eldridge last served with Herndon Sales and Service, a Timken Silent Automatic distributor in Chicago. His territory will include North Dakota, South Dakota and portions of Iowa and Minnesota.

TWO HUNDRED FIFTY-TWO CLEVELAND CONTRACTORS and members of their organizations, were guests of Viking Air Conditioning and nine Cleveland jobbers at a party recently held at the Viking plant, 5600 Walworth Avenue, Cleveland.

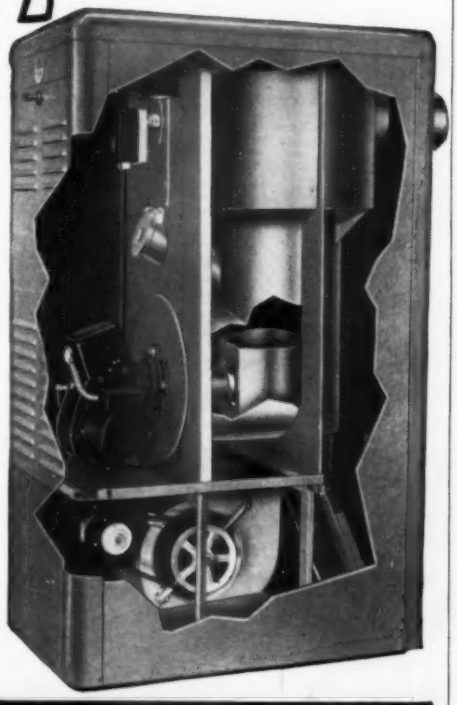
The host jobbers were Baird-Foerst Corporation,

LOWER YOUR INSTALLATION TIME and COSTS

The Certified HI-BOY

COUNTERFLOW WINTER AIR CONDITIONER

OIL FIRED HEATING UNIT FOR SMALL HOMES



A COMPLETE PACKAGE UNIT

Complete with oil burner and automatic controls • Assembled and wired at the factory prior to shipment • Crated and shipped to the building site in one piece . . . ready for use when uncrated and fuel and power lines have been connected.

FOR RANCH TYPE OR CONVENTIONAL HOMES!

Floor space only 25"x 38"

The Certified Hi-Boy makes the basement really a livable portion of the conventional home. Both supply and return ducts enter at the top of the Hi-Boy cabinet where they will not be in the way. The cabinet itself is as attractive to the eye as any refrigerator.

In ranch type homes where utility room floor space is so valuable, the Hi-Boy is ideal. The duct arrangement leaves utility rooms uncluttered . . . simplicity of design makes it easy to clean and service in hard-to-get-at places.

Install the CERTIFIED HI-BOY—for optimum comfort and definite fuel savings for your customers . . . easy installation and service for you!

See your Certified representative or write now for bulletin No. 902-C

CERTIFIED FURNACE CO.
DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY
1000 BERRY AVE. • ST. PAUL 4, MINNESOTA

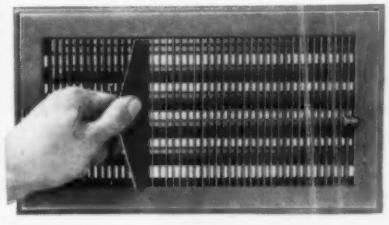
THE BEST by U.S.

COST NO MORE

Top-Value times are here again! U. S. Register lines—for many years the standards of value—are now available for immediate delivery. No longer do you need to struggle along with inexpertly designed and crudely made products. Note these typical values.

No. 40 SERIES U. S. Gravity Baseboard Registers

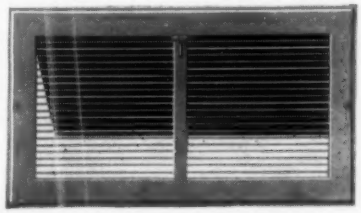
Make all the comparisons you want, there is nothing that equals the No. 40. It is smartly modern in design—perfectly suited in any home surroundings — and it gives you important savings on installation costs. It is of two-piece construction. The removable grille attaches to the baseboard frame with Patented TURN-BUTTONS. No screws to lose.



No. 256 4-Way Flow A-C Registers

This is the most versatile of modern Air-Conditioning registers. It can be installed in *any location*—sidewall or ceiling—with *any style* stackhead and *air flow from any direction.* Its adjustable back louvres and bendable grille bars, let you direct the air up or down, right or left, with least resistance to meet all heating needs. It positively has no Equal in the Register Field.

No. 153 A-C Registers



When you come to those knife-sharpening competitive jobs for folks who want the benefits of forced-air at reduced cost — install No. 153. It is good looking. Its adjustable grille bars hide the interior. And *it is the best constructed type of single valve register in the industry.* Not a mere stamping—but real mechanically perfect merchandise you can depend on. Assembled Corestock and Margin Frame Creates the most rigid Construction. Use U. S. 125-S and 125-B Studding Frames and Cut Installation Costs.

NEW! U. S. No. 50 Pocket Manual
SEND FOR YOUR COPY TODAY

Also ask for 41-F, Gravity and A-C Pipe and Fittings

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

Decker-Reichert Steel Company, Dornback Furnace and Foundry Company, Faultless Heater Corporation, Furnace & Boiler Parts Company, Inland Steel Corporation, State Supply Company, Stevens Supply Company, and George Worthington Company.

The guests toured the plant and saw how fans, blowers, and humidifiers are actually made. Of special interest to the dealers were the 250 ton capacity press and Viking's testing laboratories known as "The Cave of the Winds."

After the tour, the guests gathered in the meeting room and enjoyed a short program handled by Richard Gang, Viking dealer field man. The dealers were shown the tremendous potential for blower-package sales, how a blower is sold in the home, and how a blower-package is installed.

A furnace was set up on the stage and two Viking men, with the help of some clever prefabricating converted the gravity job to a complete winter air conditioning unit in twelve minutes flat. Laughter rang through the hall as Jack Green, Viking's advertising man, installed a humidifier in the record time of 42 seconds.

Viking President Marion I. Levy, Sales Manager Frank Gibbons, and Ohio salesman Tom McIntyre handled the round-table session.

WAYNE MCCARTHY has been promoted to the position of North coast regional manager of the Minneapolis-Honeywell Regulator Company, according to an announcement by Thomas McDonald, vice president in charge of sales. Mr. McCarthy succeeds John B. Banks, who has resigned to take a position with another firm.

The company's northwest region, with headquarters in Portland, includes the areas surrounding that city as well as Seattle, Spokane and other Washington and Oregon cities.

Wayne McCarthy

Wayne E. Petersen

Mr. McCarthy, a native of Helena, Montana, attended the School of Mines at Rapid City, South Dakota, and the University of Minnesota where he majored in mechanical engineering. He spent five years in the contracting business at Mitchell, South Dakota, before joining the Honeywell sales organization in 1937.

Wayne E. Petersen who has been on the company sales staff in Des Moines, will succeed McCarthy as Des Moines branch manager.

WALLACE F. HASTIE, assistant manager of the Chicago sales office of the American Radiator & Standard Sanitary Corporation, has been named manager of the San Francisco sales office, according to an an-

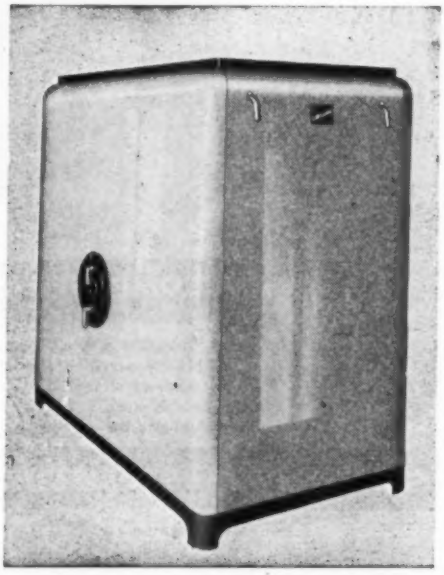
TJERNLUND

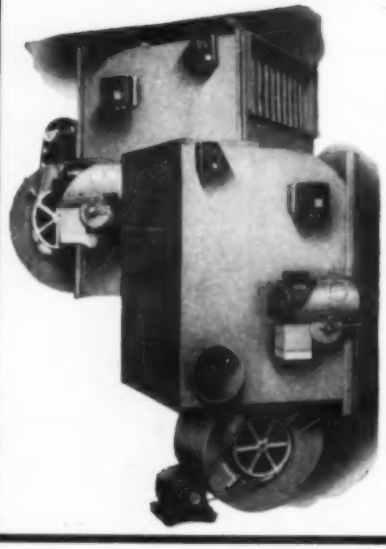
QUICK HEAT

DOMESTIC AND INDUSTRIAL

HEATING UNITS

EASIER SALES AND MORE SATISFIED CUSTOMERS





The variety of models to suit practically every heating purpose makes QUICK HEAT a recognized profit builder for warm air heating dealers. Practical application of sound engineering principles combined with extensive experience has produced this highly recognized line of superior equipment. Performance and convenience of these units proves business building quality to dealers handling this line.

Overhead Units For Ceiling or Wall Mounts

READY FOR INSTALLATION

Floor units are mounted on legs to prevent rusting of bottoms and eliminate air leaks. Factory assembled in attractive casing with new type heat saver and specially designed gun type oil burner. Convenient and quick installation.

Dealers: WRITE FOR DESCRIPTIVE LITERATURE

TJERNLUND MFG. CO.
2140 Kasota Ave. St. Paul 8, Minn.

FOR NEW FURNACES

FOR FURNACE REPAIR

"Tops" IN HEAT RESISTANCE AND ADHESION . . .

THARCO has successfully withstood temperatures up to 2500° at Detroit Edison and for long periods — that's nearly 50% higher than normal warm air furnace temperatures.

THARCO seals BOTH sides of the joint — gas-tight, smoke-tight — yet it's resilient enough to care for all normal expansion and contraction . . . and, Mister, it STAYS PUT **permanently**, thanks to the secret Armstrong formula!

THARCO Asbestos Furnace Cement comes in 1-lb. to 350-lb. metal containers — **ready to use**. See your jobber, or write us today for complete information.

THE ARMSTRONG COMPANY

4065 SO. LA SALLE STREET, CHICAGO
241 SO. POST AVENUE, DETROIT
319 SO. CROWDUS STREET, DALLAS

SPEEDY Power Twins SAVE Assembly Time!

BUY VAN DORN HOLGUNS *for drilling lead holes, bolt holes and holes to be tapped. Drive twist drills up to ¼" diam. in steel, wood augers up to ½" diam. in hardwood, Hole Saws, small wire brushes for cleaning and burnishing.*

BUY VAN DORN SCRUGUNS *for fast, accurate screw driving and nut running. Drive machine screws to ¼", self-tapping screws to #12, wood screws to #10 x 2". Positive and adjustable clutch models.*

VAN DORN HOLGUNS* and SCRUGUNS* make a perfect team for speeding up metal frame assembly work because: (1) Their compact, lightweight, well-balanced design makes them easier to handle, reduces operator fatigue, gets them into hard-to-reach spots. (2) Their full-powered Van Dorn-built motors insure continuous, trouble-free production. (3) Their extra-tough gears, shaft and chuck spindles and husky housings give you *extra* years of service. Call your nearby Van Dorn Distributor for a profitable demonstration of these cost-cutting tools. Write for free catalog to: THE VAN DORN ELECTRIC TOOL Co., 782 Joppa Road, Towson 4, Md.

*Trade Mark Reg. U. S. Pat. Off.

For Power Specify

"Van Dorn"

PORTABLE ELECTRIC TOOLS

(DIV. OF BLACK & DECKER MFG. CO.)

DRILLS • SANDERS • BENCH GRINDERS • PORTABLE GRINDERS

nouncement by D. D. Couch, vice president and general manager of sales.

Mr. Hastie began his career with American-Standard after graduation from Rhode Island State College in 1938, where he studied business administration. He joined the Boston sales office and remained there until his promotion to assistant manager of the Chicago office two years ago. During the war Mr. Hastie served with the infantry and was discharged with the rank of major.

FRANK J. MCCUSKER has been appointed sales representative of the Fitzgibbons Boiler Company, Inc., in the Philadelphia area, it was announced recently by John R. Collette, manager of field sales for Fitzgibbons.

He joins Mr. Edgar N. Black, III, and Mr. William C. Wetherstine, Jr., in the Fitzgibbons Philadelphia office so that a closer and more continuous contact may be maintained among architects, engineers, wholesalers, heating contractors, and automatic heat dealers in that area.

Mr. McCusker comes to Fitzgibbons with a background of long experience in the heating business. From 1926 to 1933 he was manager, eastern Sales Division, Philadelphia, Pa., for the Trane Company of Wisconsin.

After the war and 8 years of Army service, Mr. McCusker became Philadelphia district representative for the Iron Fireman Manufacturing Company, a position from which he just resigned to join the Fitzgibbons sales force.

F. J. McCusker

Ray Bissell

THE PROMOTION OF R. A. BISSELL to sales promotion manager of Bryant Heater Division, Affiliated Gas Equipment, Inc., was announced by J. N. Crawford, director of sales.

Mr. Bissell comes to Bryant's headquarters with a broad knowledge of the industry. Having spent thirteen years with Brooklyn Union Gas Co., as district heating supervisor, he then joined Bryant's New York factory branch in 1945 and has been with the Cleveland headquarters' office since December, 1948.

Mr. Bissell will co-ordinate Bryant sales promotion activities for the entire United States.

DUNBAR METAL & SUPPLY COMPANY, a wholesale firm handling sheet metal, roofing, heating equipment, and machinery, has moved to a new location where all warehouse stock will be consolidated under one roof.

Their new mailing address is Spring Hill Station, Box 278, Charleston 3, West Virginia.

RUBBER
(Neoprene)
PRECISION
BEARING
METAL
Silent
RUBBER
Insulated
Ball Bearing Equipped
EDR rubber insulated pillow blocks are especially designed for ventilating and air conditioning fans, furnace blowers and other installations where quietness is of first importance, and freedom from lubricating problems is a must.
The EDR's remarkable quietness stems from its precision ground ball bearing which is cushioned in synthetic rubber. It is electrically grounded and designed to compensate for normal misalignment during installation and operation.
The housing is a rigid, sturdy one piece casting, service-proven for over ten years. Ample lubricant capacity assures years of carefree service. Lubricant seals are of the labyrinth type—free running—non-wearing.
Write for EDR BULLETIN for complete details and dimensions
AHLBERG
BEARING COMPANY
Manufacturers of CJB Master Ball Bearings
3013 WEST 47TH STREET, CHICAGO, ILLINOIS
CJB
by Ahlberg
BALL BEARING
PILLOW BLOCKS

NEW!

John Zink

CENTRAL HEATING PLANT

Can Be Installed

— In —

ATTIC — BASEMENT or CLOSET

Write for Information

•

John Zink

WALL HEATERS

All Standard Sizes

•

For Natural, Mixed, Manufactured or LP Gases

Write for Literature

John Zink Company

4401 SOUTH PEORIA

TULSA, OKLAHOMA

New York — Salt Lake City — Houston — Los Angeles

new!

DELTA® "Dual Weld" Combination Welder

Combines 5 KVA Spot Welder and 120-ampere Arc Welder!

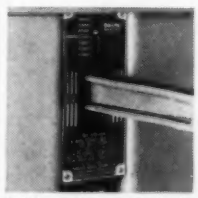
You can do these 4 jobs with this one money-saving combination:

❶ Spot weld ❷ Arc weld ❸ Braze ❹ Solder

DELTA MILWAUKEE

3 of 7 Outstanding DELTA Features!

One-piece Welding Horns



Calibrated Current Scale

Wound Transformer Core

Spot weld fine wire as efficiently as 16-gauge steel, without burning or overheating — on a production basis. Do all light-duty production spot welding and intermittent arc welding faster and more uniformly. Change from one operation to another in a hurry.

You can — with this Delta Combination Welder. It saves you money, too. It costs much less than an individual 5KVA spot welder and 120-ampere arc welder. There's no other welder like it! Delta upholds its reputation for top quality, with features that assure low maintenance and operating costs.

Have your nearby Delta distributor show you this new Delta Combination Welder. Also see the new Delta 5KVA Spot Welder and the Delta 120-Ampere Portable Arc Welder. And ask about buying on easy time payments. Look for the name of your Delta distributor under "Tools" in the classified section of your telephone directory.

Send for free Bulletin AD-453.

POWER TOOL DIVISION

Rockwell

Manufacturing Company

MILWAUKEE 1, WISCONSIN

Tear out coupon and mail today!

Power Tool Division
Rockwell Manufacturing Co.
790L E. Vienna Ave., Milwaukee 1, Wis.

Please send me Bulletin AD-453 describing the new Delta Welders.

Name_____

Title_____

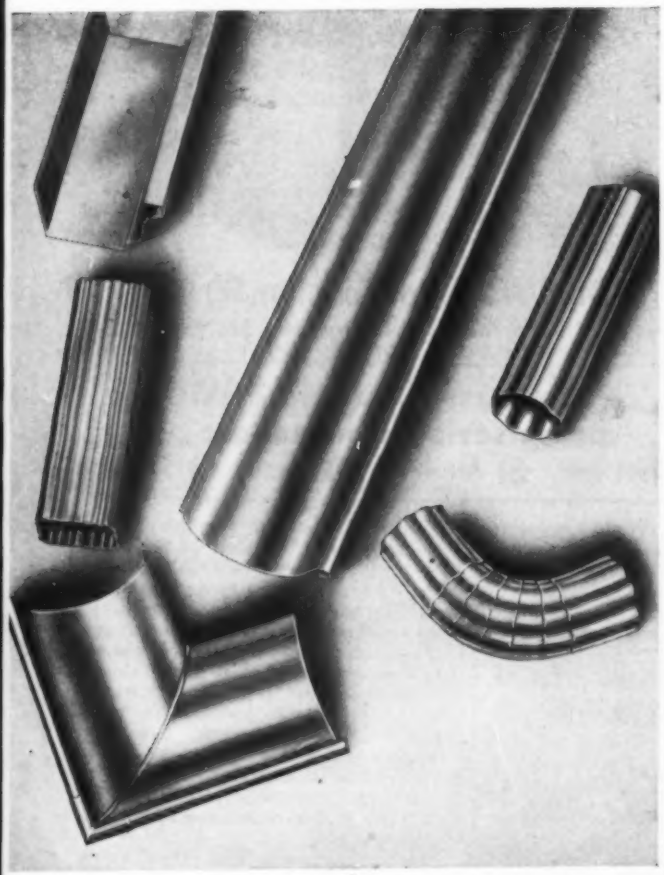
Company_____

Address_____

City_____ ( ) State_____

DW-38

STAINLESS STEEL
ROOF DRAINAGE
PRODUCTS



Conductor Pipe • Fittings • Eaves Trough

"THE PUBLIC APPRECIATES QUALITY"

This truth was convincingly demonstrated at the recent Philadelphia Home Show, where thousands of home owners expressed great interest in a display of Stainless Conductor Pipe and Eaves Trough.

Home owners in your locality will be just as quick to appreciate the advantages of a Stainless Steel Roof Drainage System, and here lies an excellent "Profit Opportunity" for progressive sheet metal contractors.

Take advantage of the fact that "The Public Appreciates Quality" and build a reputation for high quality roof drainage installations with the Obdyke line of Stainless Steel Pipe, Eaves Trough and Fittings.

We stock all standard sizes of Conductor Pipe, Eaves Trough and Style "K" Gutter, and all necessary fittings.

Please write us today for more information

BENJAMIN P. OBDYKE, Inc.

445 N. 8th St. **Philadelphia, Pa.**

REALIZING THE NEED for a trained sales force, the American Radiator & Standard Sanitary Corporation has just put into the field the fourth class of sales trainees to be graduated since World War II.

The group of 25 young men have just finished a six month program of classroom study, and are being given permanent assignments where they will complete their year of training under actual field conditions. These men were selected from the company's 21 sales office territories and were sent to study in training centers at Pittsburgh, New York and Chicago.

The group's classroom studies were climaxed by a three-day meeting in Pittsburgh, where they were addressed by officers and company department heads, who briefed them in departmental details.

Four of the 1949 class of American-Standard sales trainees are being shown their territories by D. D. Couch, vice president and general manager of sales. From left to right they are: Mark Marshall, Mr. Couch, Robert L. Towner, Frank Macielag, and O. I. Clark, Jr.

Theodore E. Mueller, president, greeted the men on their arrival in Pittsburgh and spoke to them of the prospects in the heating and plumbing industry.

D. D. Couch, vice president and general manager of sales, with Daniel J. Quinn, assistant general sales manager, and Ray F. L'Hote, manager of market research, outlined the course they were to take during their stay in Pittsburgh.

The subjects studied by the trainees in their plumbing and heating schooling included manufacture of heating and plumbing products, plumbing systems and codes, complaints, defects and damages, principles of radiator heating, job inspection, heat loss estimating, duct distribution systems, preparation of specifications, reading plans, time payment selling, and advertising and sales promotion.

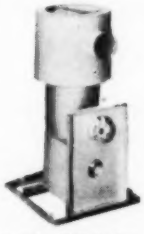
"The men who were graduated from our sales training program," said Mr. Couch, "have been thoroughly prepared to give excellent service to our customers and the public as they take up their various stations."

JOHN L. HARVEY COMPANY of 310 Radio Central Building, Spokane, Washington has been appointed representative for the Roof Ventilator Division of The Swartwout Company, Cleveland, according to E. H. Belard, sales manager. Mr. Harvey assumed his new affiliation which augments other industrial equipment lines he is handling, late this summer. His territory for Swartwout is the area west of the Cascade Mountains and includes northern Idaho.

Dealers Say!—"DUAL–X" GETS THE OIL FURNACE ORDER FOR US

80,000 BTU
"R" Series Hi Boy

80,000 BTU
Lo Boy



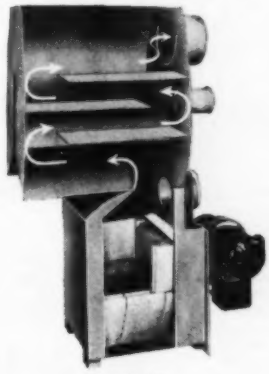
Sturdy "R" Series
Heat Generator

STURDY "R" SERIES FOR THE PRICE BUYER

- High Quality Pressure Burner
- Precast Combustion Chamber
- Beautifully Finished Cabinet

72,000 BTU
Gravity Model

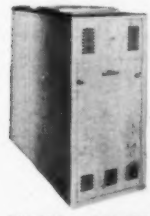
THE TRULY DIFFERENT "M" SERIES FOR THE QUALITY BUYER



"M" Series
Heat Generator

Cutaway showing extremely long flue gas travel—16 ft. on #110M—Constantly upward—No down draft to cause soot accumulation.

Table Top Demonstrator of this Furnace Body Now Available



110,000 - 160,000
210,000 BTU.

Down flow models now available for radiant floor heating
70,000 and 100,000 BTU

DUAL-X FURNACE MFG. CO.
6560 S. Wentworth Ave.
Chicago 21, Illinois
FACTORY—MICHIGAN CITY, INDIANA

CRISE HEAT CONTROL
FOR ALL HAND-FIRED HEATING PLANTS

BEAUTIFUL WALL THERMOSTAT WITH FULL TEMPERATURE INDICATION

The Crise thermostat has such wanted features as temperature indication and heat anticipation. Differential is adjustable. Silver contact points assure trouble-free long life. The beautiful case is finished in a rich, neutral gold tone.

Over one million Crise heat controls are now in service.

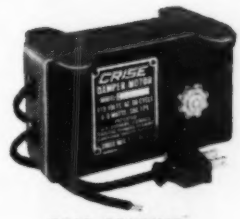
you can't beat it
For
Quality and Value

ONLY **$13.95** DEALER PRICE

Lots of 6—$13.45 Lots of 12—$12.95

You can't handle a better heat control than the Crise. Consider such extra quality features as the patented, electric reversing, ball bearing motor; the streamlined, temperature indicating thermostat; the hi-limit safety control and return spring. Consider that all these units come in a single package with everything needed for easy installation down to the last screw. Here's real value and it will return you big profits.

(Hi-Limit control)
"SURF-A-STAT"



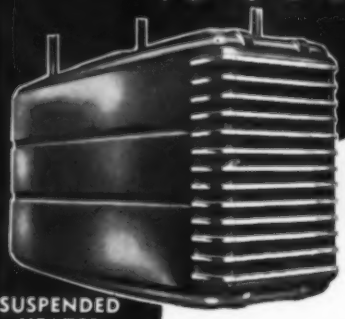
BALL BEARING MOTOR

Write for literature and name of nearest jobber

CRISE MANUFACTURING CO.
COLUMBUS 16, OHIO

Pacific

HEATING EQUIPMENT IS YOUR BEST BUY



HERE'S WHY

SUSPENDED HEATER

SUSPENDED HEATER

CONSOLE HEATER

FLOOR & WALL FURNACE

FORCED AIR FURNACE

DUCT FURNACE

HUMIDIFIER

LEADERSHIP IN ENGINEERING AND DESIGN Laboratory and consumer tests prove Pacific to be superior in efficiency and economy.

APPEARANCE There's none better -- We invite comparison and you be the judge.

A COMPLETE LINE Gives thorough market coverage Residential - Commercial - Industrial.

COMPETITIVE PRICES $ for $, value for value Pacific Heating Equipment gets the customers preference every time.

100% BACKING TO DISTRIBUTORS AND DEALERS For the first 6 months of this year possible readership of Palmer paid ads was over 75,000,000 people!

MR. DISTRIBUTOR — MR. DEALER

Here's heating equipment that has all the features for a profitable sales building operation.

Write dept. A-1 to-day for your specifications and advertising literature.

PALMER MANUFACTURING CORP.

Manufacturers of the famous SNO-BREZE AIR COOLERS

PHOENIX, ARIZONA

C. E. Lewis, president of the Perfex Corporation, Milwaukee, manufacturer of automatic temperature controls, announced that W. A. Matheson, Jr. has been named manager of their newly created New Products division. In this capacity he will handle sub-contracting for supplementary production and research for new products.

Mr. Matheson is a graduate of Lehigh University. He served three years in the armed forces, and most recently was manager of contract sales for Williams Oil-O-Matic Division of Eureka-Williams Corporation.

W. A. Matheson, Jr.

C. M. Wilson

C. Milton Wilson has been appointed sales manager of Anemostat Corporation of America, it was announced by August Rust-Oppenheim, president. Mr. Wilson, formerly manager of sales of Ingersoll Division of Borg Warner Corporation was also associated for many years with Clyde R. Place, consulting engineer, on major New York building projects including the Waldorf Astoria Hotel, Rockefeller Center and the Metropolitan Life Insurance Buildings.

During the war he was a production engineer for the Army Air Forces at Wright Field. He was later transferred to the Manhattan District Project as an executive engineer.

Two New Distributors have been appointed in the Pittsburgh area for the triethylene glycol air cleansing and humidifying unit of National Air Conditioning Incorporated. They are Demmler Bros. Company, 100 Ross Street, and the Anchor Sanitary Company, 213 Water Street. These wholesalers join Eckstein Company of Pittsburgh in distributing TEG Conditioners in western Pennsylvania, West Virginia and Ohio.

Fred H. Gallup has been appointed manager of distributor sales of the automatic heating division of the General Electric Company's Air Conditioning Department, it was announced recently by H. J. Wines, sales manager of the division.

Prior to joining General Electric, Mr. Gallup represented various heating equipment manufacturers throughout metropolitan New York.

A native of Hudson Falls, N. Y., Mr. Gallup most recently was sales manager of Chrysler Airtemp Distributors.

Payne Furnace Division, Affiliated Gas Equipment, Inc., will soon move its manufacturing facilities from Beverly Hills to Monrovia, California, where the plants of the Day & Night Division, manufacturers of water heaters and Panelray space heaters, are being ex-

Round Cased
A. C. Steel Furnace

Oil-Fired Winter
Air-Conditioning Unit

High Efficiency
Oil Burner

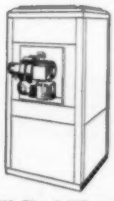
Homer Outdoor
Garden Grill

Blower
Package Unit

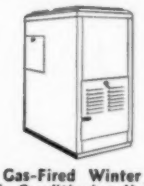
Improved
Pipeless Furnace

Extra Profits WITH HOMER

Square Cased
Steel Furnace



Oil-Fired Winter
Air-Conditioning Unit



Gas-Fired Winter
Air-Conditioning Unit

Homer's new line of oil, gas and coal furnaces places our dealers in an enviable position in meeting all heating requirements. Not only in efficiency and materials, but in prices, too.

Our fine new line gives the dealer a wide variance in sizes: running from 75,000 to 400,000 BTU's; and in addition to furnaces, Homer can supply other kindred heating equipment . . . such as blowers, conversion oil burners, filters, controls, repairs, etc.

Homer Agencies build Profits!

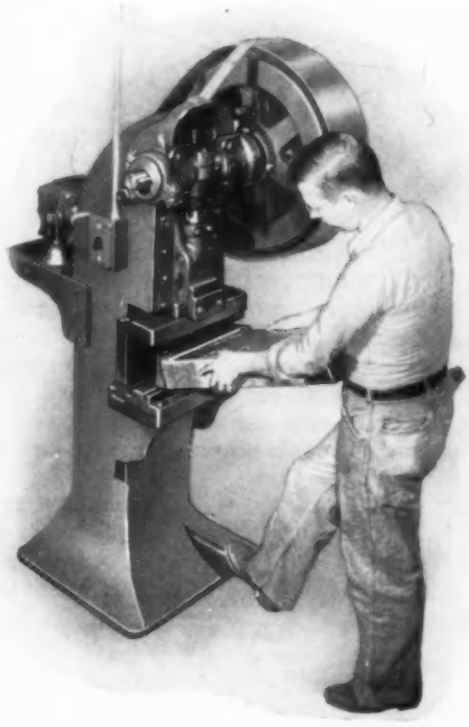
We invite inquiries from responsible manufacturers' representatives.

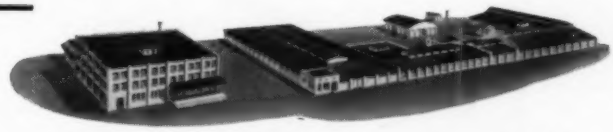
Homer Furnace & Foundry Corp.

COLDWATER, MICHIGAN

"What's home without a Homer"

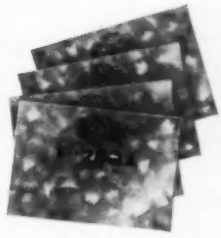
Accurate to 1-1000 Inch!





Ohio Valley Fittings are UNIFORM

No wonder Ohio Valley fittings are preferred! They are produced on the best of modern machinery where accuracy is controlled to the one-thousandth of an inch! This gives you UNIFORMITY, so that fittings GO TOGETHER without lost labor.



Union Label Imprinted on Each Fitting

Note the Union Label on each item; see, too, the easily legible markings on the galvanized steel, to avoid confusion, mistakes, delays. It pays in every way to handle the Ohio Valley line.

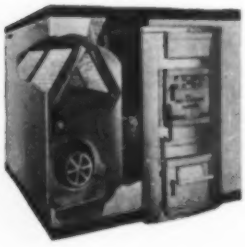
Available Through Leading Wholesalers

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

Metal Manufacturing Division of
OHIO VALLEY HARDWARE & ROOFING COMPANY
Evansville 2, Indiana

Performance Plus !
ATH-A-NOR
Coal - Gas - Oil
FURNACES
and PARTS

BABE RUTH, America's most famous athlete, established 62 major league records, including 60 home runs in one year —714 in his career.

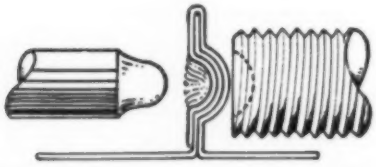


Performance plus in a heating plant means profit plus to you. ATH-A-NOR assures you of both. There is an ATH-A-NOR for every home heating NEED whether gas, oil, or coal. Ask for complete details today.

MAY-FIEBEGER COMPANY
Newark Ohio

WHITNEY LEVER PUNCHES
No. 6 Punch

This Tool is especially adapted for Button Punching or for Templet work. Punch will strip where handle cannot be opened to 90 degrees.



These punches are often called Tip Punches, and are used to fasten standing seams without making a hole, by simply indenting the three thicknesses of metal.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD ILL

panded to accommodate manufacture of the Payne line.

In addition, two new buildings are nearing completion for Payne sales office, research staff and warehousing. The Payne plants in Beverly Hills will be sold.

At the same time, Payne's retail operations will be discontinued and dealers appointed to handle the Payne line in Los Angeles and Orange counties, where retail branches have been maintained heretofore.

HERMAN NELSON CORPORATION, Moline, Illinois, manufacturers of heating and ventilating products, announces the appointment of C. A. Pickett as Chicago regional sales manager. In his new capacity Mr. Pickett will supervise sales activities in the Detroit, Saginaw, Grand Rapids, Indianapolis, Milwaukee, St. Louis and Chicago sales territories.

C. A. Pickett

L. D. Linehan

Mr. Pickett became associated with the firm in 1920 as representative in Kansas City. Later he served as manager of the sales office in St. Louis, and since 1937 has been manager of the Chicago branch sales office.

Lester D. Linehan has been appointed manager of the Chicago branch office. Mr. Linehan has had twenty years' experience in the heating industry and was with Peoples Gas, Light and Coke Company, Chicago, for many years. More recently he was Chicago branch manager for Penn Electric Switch Company.

TRI-STATE DISTRIBUTING CO., 1415 So. State Street, Salt Lake City, Utah, has been appointed distributor for APS glycol vapor and APS glycol vapor equipment according to announcement made by J. W. Kelley, vice president of Air Purification Service, Inc., Newark, New Jersey, the manufacturers.

John L. Margetts, general manager of Tri-State, is developing sales plans in cooperation with dealers in Utah and surrounding states.

Air Purification Service, Inc. has advocated the use of glycol vapor for killing the air-borne viruses which are regarded by the medical profession as a principal cause of colds, influenza, pneumonia and other respiratory diseases.

BLACK & DECKER MFG. CO., Towson, Maryland announces the appointment of Earl Roberts as a sales engineer with the Memphis branch. Mr. Roberts has

The ORIGINAL

TRI-*SAW*

(PATENT APPLIED FOR)

Cuts *Directly* Into Wall Surfaces

Without Starting Hole

Cuts Sheet Metal & Heavy Metal

Fits Any ¼" Electric Drill

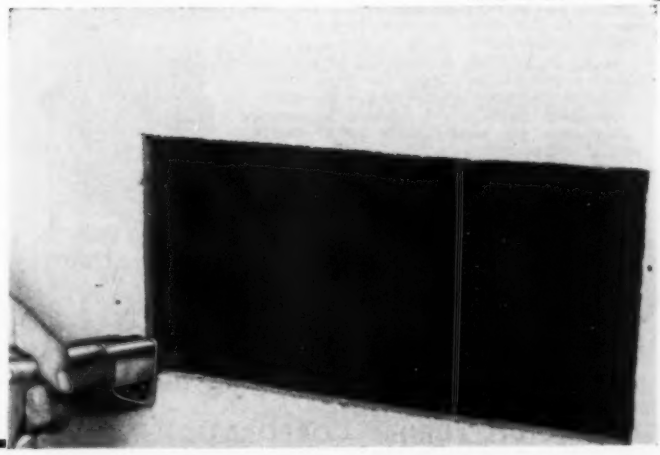
Lightweight — Only 3 lb. 4 oz.

PORTABLE ALL-PURPOSE POWER SAW

This amazing all-purpose power saw makes wood and metal cutting jobs easy — and *fast*. The TRI-*SAW* cuts *directly* into wall surfaces. No starting hole to drill — no time wasted. Cuts heavy metal and sheet metal quickly and cleanly. Easy to handle, easy to guide, free from torque or spin. Lessens worker fatigue, increases efficiency. Complete with operation and maintenance instructions and blade selection chart.

New low price, $35.00 F.O.B. St. Louis

Made in U.S.A.



Order from

TRI-PO ENGINEERING CO.
4020 S. Broadway
St. Louis 18, Mo.

E. R. PRINCETON AND ASSOCIATES
2456 W. Diversey
Chicago 47, Ill.

Now Only $2.00 for This Outstanding Book on Air Conditioning

The Third Edition of

AIR CONDITIONING FOR COMFORT

by SAMUEL R. LEWIS

288 Pages—6½" x 9¼"—Cloth Bound

Easy to understand . . . accurate . . . comprehensive . . . these are the features of this third edition of Samuel R. Lewis' well-known AIR CONDITIONING FOR COMFORT.

Fundamentals are fully and clearly covered. Correct procedure in designing complete systems for both residences and large buildings is explained step by step. In addition, considerable original data on such subjects as standards, noise control, measurements, and fire protection codes has been included.

Send $2.00 for a copy today to the address below. We know you will consider this one of the finest air conditioning books you have yet seen, but if you should be dissatisfied with it for any reason whatever, your money will be promptly returned to you.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue **Chicago 2, Illinois**

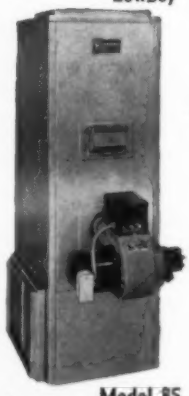
for **WARM AIR**

GENERAL AUTOMATIC

CHECKS BEST

BY TEST "**85**" with Model

Model 85 Lowboy



Model 85 Highboy

General Automatic offers extra practical comfort and economy in these attractive Winter Warm Air Conditioning Units.

All parts are factory tested and ready for quick, dependable installation.

Each furnace is complete with a General Automatic Oil Burner, Blower, Motor, Filter and all controls.

Model 85 Highboy is designed to use the smallest possible floor space for small homes requiring no more than 85,000 B.T.U. output.

Model 85 Lowboy is a standard basement installation for small homes up to 85,000 B.T.U. requirement.

Models 100, 150 and 200 for larger homes.

Territories Open!

GENERAL *Automatic*

EST. 1924

GENERAL OIL BURNER CORPORATION

2300 Sinclair Lane, Baltimore 13, Md.

AIR-FLO
AUTOMATIC
CEILING SHUTTER
FOR ATTIC FAN
Built so they can be installed practically flush with the ceiling, AIR-FLO Ceiling Shutters present a refined, finished appearance. Their natural aluminum color blends with any decoration, eliminating need for painting, and no grille or winter cover is required. Furnished in 5 different widths, single panel up to 73" long. No operating mechanism shown. Built-in fusible link. Meets fire underwriters requirements.
WRITE FOR NEW CATALOG 43-C
Illustrations and details of the complete AIR-FLO line.
AIR CONDITIONING PRODUCTS CO.
2340 W. LAFAYETTE BLVD. · DETROIT 16, MICH.

previously been with the service department of Black & Decker at Memphis.

David Rolston has joined the Black & Decker organization and will be Home-Utility sales representative in the Philadelphia territory, working closely with distributors and dealers who carry Home-Utility electric tools.

DANIEL D. KELLY has been appointed a sales engineer for the L. J. Mueller Furnace Company, manufacturers of Mueller Climatrol heating and air conditioning equipment, it was announced recently. Mr. Kelly, a native of St. Louis and for the past 12 years a heating and air conditioning sales engineer in the St. Louis area, will operate out of the Mueller central district headquarters in St. Louis and cover parts of Missouri, Nebraska, and Iowa.

Mr. Kelly is particularly qualified in his new connection because he can lay out all types of heating systems as well as recommend the proper size and type of equipment. During the war he worked in aircraft plants, laying-out heating systems. For a number of months he was in business for himself, operating as a consultant to heating contractors.

D. D. Kelly

R. C. Anderson

J. N. CRAWFORD, director of sales, Bryant Heater Division, recently announced the appointment of R. C. Anderson as the Bryant Distributor for the Houston territory.

Formerly the southern district manager for the A. O. Smith Company, Mr. Anderson's organization, the Bryant Anderson Co. will be located at 3215 Locke Lane, Houston, Texas.

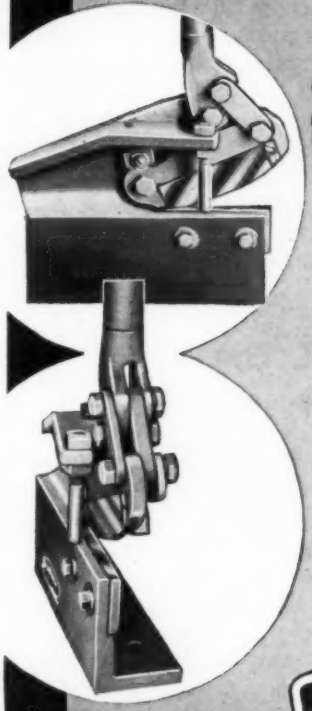
F. J. EVANS ENGINEERING CO. of Birmingham, Alabama and Mercury Sales Co. of Syracuse, New York have been appointed manufacturer's agents for the Clayton & Lambert Mfg. Co., of Louisville, Kentucky.

Rowland J. Miller, vice president in charge of sales of Clayton and Lambert, in making the announcement said the two new agents would handle the Hoffman line of water heaters and Lamneck Furnace Pipe and Fittings. Both agents will continue the C & L policy of selling through legitimate plumbing jobbers and furnace and heating jobbers.

The company has just completed a training school in Louisville for the executive and sales personnel of both agent groups giving instruction on policy, product application, sales, service and the general plan for advertising and promotion.

The F. J. Evans Engineering Co., with headquarters

BEVERLY *Slitting* SHEAR



"S-3" Slitting Shears for slitting, cutting and trimming sheet steel or any other material, have compound power transmission, which provides smooth, easy operation. Interchangeable and adjustable blades of high quality tempered and drawn tool steel are firmly held in alignment by the rigid frame to assure clean cutting, regardless of the thickness of metal—up to capacity. Unique adjustable shoe, bearing on upper blade holder, provides additional support, for the upper blade, which increases the strength and cutting efficiency of the Shear.

Slitting capacity 1/8"; trimming 3/16"; bar capacity 1/4" x 2" (capacities given are in mild steel)

Ask your Beverly Dealer for a demonstration or write for full details and illustrated circular.

High Carbon High Chrome Blades for cutting stainless available on special order.

The BEVERLY SHEAR MFG. Co.
3020 W. 111th St.
Chicago 43, Ill.

FURNACES

to

Fill Your Warm Air Needs

Armstrong
Luxaire
ModernAire

All Three Designed to Give You

Style
Price
Performance

write today to

Iowa's Largest Heating Wholesaler

DES MOINES FURNACE & STOVE REPAIR CO.

Des Moines, Iowa

Each a Masterpiece . . .

H & K GRILLES of PERFORATED METAL

LONG ACCORDED CRITICAL APPROVAL by architect and the general public alike, H & K Grilles will be found to incorporate the maximum degree of ornamental and functional beauty. Behind the artistic harmony of many H & K Grilles, a control or valve may be skillfully concealed, or perhaps the whirling blade of a fan — forever secure and absolutely SAFE!

Master craftsmanship is the key to the ever-increasing production of H & K Grilles. Using only the choicest materials in Stainless Steel, Brass, Bronze, Aluminum, etc., these grilles are economically supplied in any desired quantity. For full information, write TODAY without obligation.

Also Remember — H & K Perforated Metals for industrial applications.

The Harrington & King PERFORATING Co.

5649 FILLMORE ST., CHICAGO 44, ILLINOIS • 114 LIBERTY ST., NEW YORK 6, N. Y.

TOMORROW'S AUTOMATIC CONTROLS TODAY •

GENERAL CONTROLS MODERN, COMPACT SNAP-ACTION T-70 THERMOSTAT

Sets a new standard of Functional Beauty and Accuracy in remote control of room temperatures. This graceful, streamlined instrument extending only 1" from wall, has a stainless housing mounted on an ivory plastic base and lends enhancement to any scheme of room decoration.

The T-70 can be used either with the famed GENERAL CONTROLS B-60 "All-Gas" or the T-30 low voltage control systems, or any other standard low voltage control circuit.

REQUEST FREE LITERATURE 44-4

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.
Manufacturers of Automatic Pressure, Temperature, Level & Flow Controls

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Latest design Barber 324-B round Conversion Burner with improved controls, encased in streamlined hood. Tested and certified by AGA Laboratory under new 1949 listing requirements.

For dependability and efficiency, use Barber Gas Conversion Burners, made in sizes and capacities to fit all types of round or oblong furnaces and boilers. There is no comparison whatever between the average mixer-type gas burner and the Barber *Vacuum premixture*, employing the famous patented Barber Impinged Jet. Equip your jobs with genuine Barber units.

Send for latest Catalog on conversion burners, all types of appliance burners, and pressure regulators.

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in Birmingham and branch offices in Houston and Atlanta, has been in business for 25 years. It will represent C & L south of the Kentucky-Virginia Line and east of the Mississippi River including the states of Tennessee, North and South Carolina, Florida, Alabama, Mississippi, Louisiana, and the Houston area of Texas.

The Mercury Sales Co. of Syracuse is a partnership made up of R. J. Milholland, formerly with the American Radiator and Standard Sanitary Corp. and W. F. Hairsch, formerly associated with the New Process Gear Co. of New York. This organization will handle the C & L line in northern New York state.

Elmer L. Lipman

1893-1949

Elmer L. Lipman, 56, secretary-treasurer and member of the board of directors of Inland Steel Products Company, died September 16th after a short illness. Mr. Lipman joined the company in 1929 after serving for several years as a tax investigator for the United States Treasury Department. In 1938 he was appointed secretary-treasurer of the company, which at that time was known as Milcor Steel Company. In addition to his duties at Inland Steel Products Company, Mr. Lipman was active in various accounting societies. He was a past president of the Milwaukee chapter of the National Association of Cost Accountants and also a member of the Wisconsin Society of Certified Public Accountants. In his youth he was an amateur tennis player, winning the Wisconsin state tennis championship in 1916.

J. V. Patten Company of Sycamore, Illinois, manufacturers of the Sun Fuel-Master line of automatic oil and gas burning furnaces, in cooperation with the Homease Products Division, Paterson, New Jersey, is sponsoring a fifteen minute television program in Boston.

The program is believed to be the first of its kind to be presented from any television station.

Boston dealers participating in the preparation and presentation of the program are: Fred Johnson Company, Malden; Furnace Installation Company, Watertown; DuBois Oil Company, Newton; and General Air Conditioning & Heating Company, Somerville.

Don C. Patten, vice president and sales manager of the J. V. Patten Company commented on the show as follows, "The results of this television program have been most encouraging and the participating dealers report gratifying results as evidenced by increased sales of oil burners, furnace-burner units and boiler-burner units. The television program tells a personalized story right in the home of the better class prospect."

Bauer & Black's pressure-sensitive Industrial Adhesive Tape line has been re-named Polyken Industrial Tape. From a slow start in 1939, with two products and one salesman, Bauer & Black's industrial tape sales grew through the thirties, mushroomed under military demand during the war years, and are now

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Model of the Doyle Vac-It

Built by men who understand the problems of furnace cleaning, the Grand Rapids Furnace Cleaner has been developed into a highly serviceable unit meeting all the requirements for faster, easier and more profitable cleaning:

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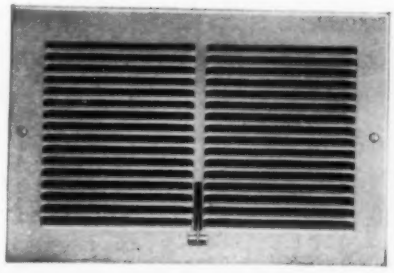

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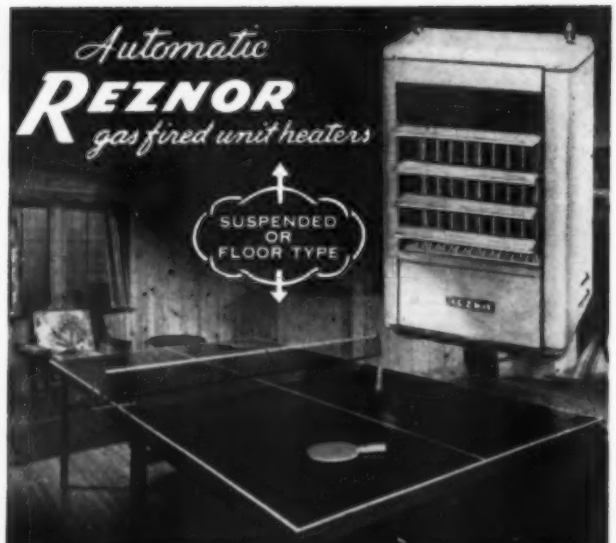

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Plus the valve mechanism that holds securely with any air pressure and KEEPS WALLS CLEAN!

FORCED AIR REGISTERS—COLD AIR FACES—FLOOR REGISTERS
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PERFORATED METALS FOR EVERY INDUSTRIAL USE

PROMPT DELIVERY. Write for information and price lists.

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far in excess of the wartime peak. The yardage of industrial tape produced and sold by the company next year is expected to exceed by 60 per cent the 1947 production figure. The change was made to establish a clearer distinction between Bauer & Black's surgical dressings business and its industrial tape program, which utilizes entirely separate sales and distributor organizations.

Polyken industrial tape is marketed through selected distributors and a special sales force, both of whose salesmen undergo an intensive continuous sales training program. Bauer & Black's immediate plans include accelerated research and production schedules, and a vastly expanded merchandising and distribution program, while familiarizing present users with the new name. Promotion of the Polyken name will be supported by announcement materials mailed through the company's distributors, and completely redesigned packages, office forms, catalogs and mailing pieces.

Arnold Kruckman—

(From page 74)

far their work has almost solely been to answer questions either by mail, wire, or in person. The intent appears to be genuine, but the character of the organization does not seem to warrant the belief that smaller business will get any more contracts. The point is important because in October something like $20 to $30 billion worth of work will be contracted for. Even in these days of astronomical figures such volume of work is bound to have a tremendous effect, if it is properly distributed. The work will be for munitions, building, and an infinite variety of equipment and appliances used by the Army, Navy, and Air Force. There will be contracts for the great variety of armaments that will be sent abroad; and there will be products which will be channeled to Europe and into the Pacific area for the use of civilians. There is hope among the members of the House Small Business Committee that proper legislation can be obtained which will make mandatory the distribution of a proportion of this work to the smaller units.

The Los Angeles Story

The extent to which smaller business is important was reflected in a statement made recently on the floor of Congress that, according to the Los Angeles chamber of commerce, virtually 80 per cent of the population of Los Angeles and its adjoining area are dependent upon smaller business for their daily bread. In the same statement it was revealed that at least 90 per cent of the smaller business firms in the Los Angeles area employed less than 50 people, and that a great number employed less than 10 persons. Los Angeles is probably the foremost community of small businesses in the United States, if not in the world.

Some Advocates Remain

D'Arcy Meyer, one of the chiefs in the procurement section of the Munitions Board of the Military Establishment, is a great advocate of the maintenance of small business in every section of the national econ-

WHITNEY METAL
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39 YEARS EXPERIENCE

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HAND PUNCHES

Versatile, powerful lever-type punches with roller bearings. Each punches and strips positively inside 90°. Punches and dies can be changed quickly. Lever cannot become disengaged by moving too far in either direction.

	No. 7	No. 7½	No. 8
Capacity —	1/4" thru	1/4" thru	1/4" thru
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Throat Depth	1-7/8"	2"	2-1/8"
Length Overall	18-1/2"	22"	25-1/2"
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Irregular Shaped Punches and Dies Available

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Saves Installation Time
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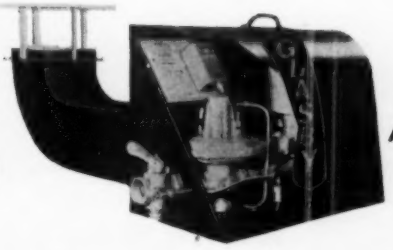

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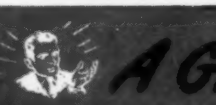

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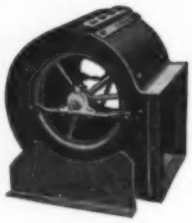

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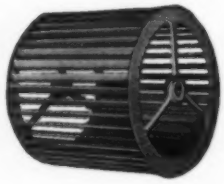

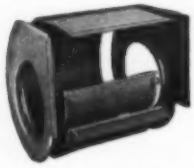

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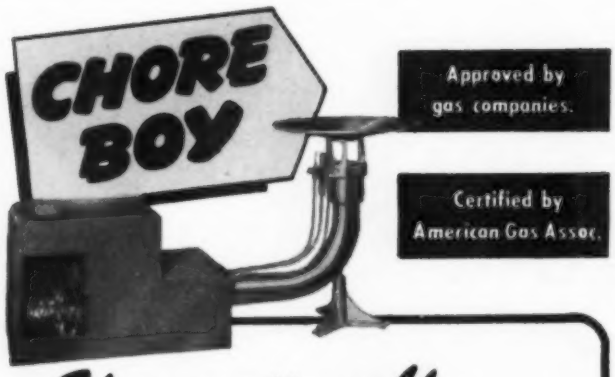

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omy. There is undoubtedly a growing body of men in the Government who realize the need for the preservation of the smaller units. The men in the Department of Commerce charged with acting as liaison between the citizen and the various Government departments that have something for which they wish to make contracts are earnest, sincere, and spend their energy devotedly; but there are only eight of them. They are badly understaffed and hampered by every lack, including lack of funds. Congress refused to appropriate a modest sum for the maintenance of the small business division of the Department of Commerce. To secure the necessary appropriations as well as the necessary legislation there must be concerted action by those who are concerned with small business. It is the purpose of the National Alliance of Independent Business to arouse such support in order to secure essential action from the next Congress. It is clear that the preservation of small and independent business units has in it the core of the preservation of democratic independence in its larger sense. The smaller units are not so easily susceptible to regimentation.

An Inactive Congress

Congress has had much deserved criticism for the delay in enacting highly necessary legislation. The national economy is scarcely aware of the fact that the huge appropriation bills which were absolutely essential have been kept in suspension virtually since June 1. The enactment of these bills, to a very considerable degree, would have had a substantial effect upon the business of the nation. The release of huge sums in the stalled appropriation measures inevitably would have quickened the economic life of every community. It is hoped now that the Army Civil Functions Appropriation, Foreign Aid Appropriation, Interior and Third Deficiency Appropriation, and the Military Establishment Appropriation will be taken up and acted upon by the House-Senate conferees. It is hoped their enactment will follow shortly thereafter. One reason for the delaying action of the Senate, which has held up the work of Congress, is said to be the fear of many members of the Senate that the President might treat the steel industries roughly in case of a strike. It was their opinion that he would seek to use the emergency law passed last year which empowered him to seize the steel industry, as well as other industries, in case of emergency.

At this writing, towards the end of September, the steel strike and the coal strike seem very likely. In the event these strikes occur it is believed many allied industries will have strikes. The feeling in Washington is that these strikes will be of short duration. There is, however, a very important minority in the Capitol who think that strikes will be prolonged and may lead to all sorts of unexpected consequences. They fear that there is a highly radical group in the labor unions as well as in the Government who wish to use the situation to bring nationalization of industries nearer.

It is pointed out that the added labor cost in heavy industries as a whole will be around 7c per hour. Congress thinks that John L. Lewis will be compelled to settle for the miners without adding much to cur-

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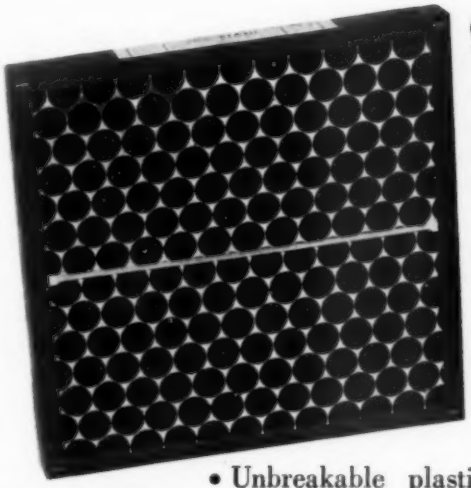
The PLASTI-STATIC AIR FILTER features



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Easily installed, summer or winter by anyone in 3 to 4 hours. Lightweight, needs no foundation. Suspends from ceiling or floor joists. A more efficient chimney with better draft.

• **COMPLETELY PACKAGED**
Easy to handle, minimum stock enables you to supply any 1 or 2 story house with any roof pitch. Furnished complete, all parts for entire installation.

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rent coal prices. It thinks that the steel, auto, electrical, rubber, and other industries have savings on raw materials, new processes, and increased plant efficiency and therefore Congress feels that these industries can sacrifice some of their profits to make up whatever is needed for labor costs.

Congress does not think that all the cost of pensions and welfare should be loaded on the shoulders of the industries. They agree with the industries that the workers should make their contribution to the necessary funds. On the other hand, the union leaders feel that the workers would rather have more money in their pay envelope than to have pensions. The general trend in thought is that there may be an out in arranging pensions smaller than $100 a month. It is the general impression that this whole question of pensions, insurance, and the general welfare program will not be definitely settled until the Government's Social Security system is overhauled and rehabilitated on a sound, satisfactory basis. It is also the general impression that strikes on the security or pension issues will not be popular with the workers.

Konzo—

(From page 82)

Table 1—Floor Edge-Loss Factor

Outside design Temperature, deg F.	Type of Insulation at Edge	
	1 in. edge insulation 12 in. down and below slab surface	2 in. edge insulation 24 in. down and below slab surface
-20	85	70
-10	80	65
0	75	60
10	70	55

Notes: Values estimated from University of Illinois Small Homes Council investigation of floor slabs. Values of 0.55 and 0.44 Btu per lineal foot per hour per deg difference in temperature were obtained by extrapolation of curves in Fig. 27 of the original report for the 1 in. and 2 in. thicknesses, respectively. Average air temperature of 135 F. was assumed on one side of the floor slab and design outdoor temperature on the other. The above values are subject to later correction.

Table 2—Heat Emission From Heated Floor Surface to Room

(Room air temperature, 70 F, Average surface temperature of room, excluding panel, 65 F, emissivity of 0.90)

Panel Surface Temperature deg. F.	Heat Emission, in Btu per sq. ft. per hr.
70	4.5
75	13.0
80	21.0
85	30.0
90	40.5
95	50.0
100	61.5
105	73.0
110	84.5
115	96.5
120	109.0

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There's no lost time in juggling or cutting to fit when you use Youngstown Fittings. Our production of pipe and fittings for gravity and winter air conditioning is planned and executed with a minuteness of detail to assure you a perfect fit every time.

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. . . remember

YOUNGSTOWN FITTINGS **FIT!**

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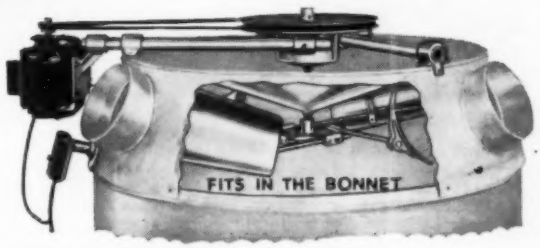
NOW CONTROL HEAT DISTRIBUTION ON GRAVITY FURNACES

with CIRCULATAIRE



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Include a CIRCULATAIRE with each new gravity job and also take advantage of the thousands of gravity furnaces in your community that need a CIRCULATAIRE to balance heat distribution.

NOW READY! New CIRCULATAIRE Selling Aids help you sell CIRCULATAIRES and boost new furnace sales.

GET THE FACTS TODAY! WRITE . . .

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Nothing for the dealer to furnish except limited amount of labor.

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Please send additional information on your Super Clipper

Address_____

Name_____

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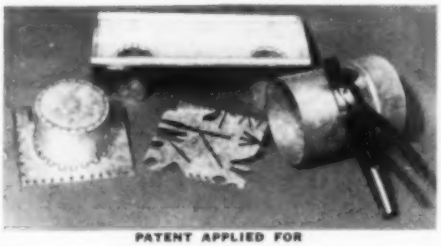

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The above cut is descriptive of how this Shear cuts Pipe, Nibbles and Dovetails. All done with a minimum of distortion to the sheet.

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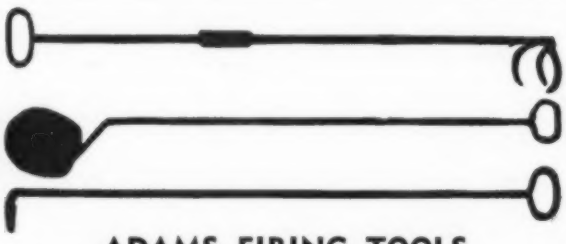

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UNDERWRITERS' APPROVED

La Salvia—

(From page 85)

same amount of outside air as taken through the furnace or air conditioner. This function is known as *exfiltration*.

In general, the full amount of air classed as infiltration will enter only under conditions of high wind velocities. When wind velocities are low this infiltration will be decreased considerably and sometimes entirely eliminated. Ventilation by infiltration is not dependable and cannot be controlled.

If ventilation is absolutely necessary outside air must be brought in directly through the furnace or air conditioner. In this manner the amount of ventilation can be controlled.

Whether outside air enters through the furnace or air conditioner or through cracks and clearances, it is still a heat load which must be considered in sizing the heating unit.

Residential Ventilation

To determine the amount of ventilation required for a residence, follow the same procedure as when determining infiltration. Determining sensible and latent heat loss is a similar process.

When designing a year around air conditioning system use the infiltration method for the heating season requirements and calculate the outside air, or ventilation through the furnace, for the cooling season and mild weather conditions. The duct system will then be capable of handling the amount of air required for both the heating and cooling seasons.

Transmission Heat Loss

The formula for determining transmission heat loss through wall, floors, ceilings, roofs and glass is:

$$H_t = U \times A \times (t_i - t_o) \qquad (7)$$

Where,

H_t = Transmission heat loss Btu per hour
U = Coefficient of transmission air to air Btu/ hr/sq ft/ per degree temperature difference
A = Sq ft of wall, floor, ceiling, roof or glass
t_i = Inside design temperature
t_o = Outside design temperature

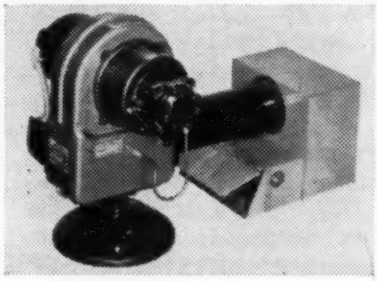
Example: Given 200 sq ft of wall consisting of 4 in. brick veneer, 4 in. common brick, ½ in. gypsum board and ½ in. gypsum plaster applied directly to the interior surface. The inside design temperature is 70 F and the outside design temperature is 0 F. What is the transmission heat loss? The coefficient of transmission U is .41.

$H_t = .41 \times 200 \times (70 - 0)$
$H_t = 5740$ Btu per hour

The transmission heat loss in this case is 5740 Btu per hour.

The next article in this series will take a typical two story residence and show how the heat loss and heat gain are calculated for the three cities mentioned above in this installment. Design of a year around air conditioning system is the problem to be illustrated.

HERE IS THE ANSWER



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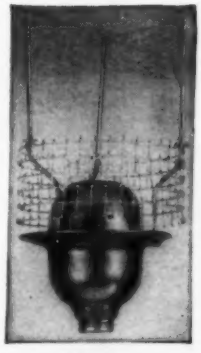

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The FloRite is an unsurpassed sales and service aid in heating, ventilating and air conditioning work. On installation and service work it is used to determine velocity and direction of air flow from registers and grilles for the purpose of checking rate of air delivery, balancing the system and adjusting deflecting vanes and louvers of registers so as to obtain "draft free" air distribution. These tests cut installation and service time, prevent expensive call-backs, and promote customer goodwill. The FloRite is equally helpful for selling new equipment or modernization. It can be used in many ways to convincingly demonstrate discomforts and inefficiencies of a worn-out or inadequate system.

The FloRite is entirely self-contained. It has no hose or probe, and gives all readings required for heating, ventilating and air conditioning work. The detachable handle facilitates use of the FloRite at low wall or high side wall registers. By screwing a ⅛" pipe into the handle the FloRite can be conveniently held against ceiling grille.

The FloRite is equipped with a unique scale lock which makes it possible to retain the reading until the lock is released. For ceiling grille readings, this lock is easily manipulated by means of a piece of string. This feature makes the FloRite exceptionally adaptable for indicating air velocity in hard-to-reach or dimly lit locations.

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We solicit inquiries on slitting of metal up to 36 inches wide and 14 gauge and lighter.

"Made-Rite" Co., Inc.

10th and Monroe St. Newport, Ky.

Nason—

(From page 88)

sheets for ready reference. Two similar files were seen in the front office.

Another sheet steel storage and active flat file, a part of the foreman's table, is an assembly of wooden shelving spaced 1½ in. apart. Trays are used in these shelves to hold blueprints and other papers too large for the cabinets previously described. It was said that making these cabinets in the shop saved the company nearly $1,000.

Careful management shows up in other ways around this shop, too. The inventory of raw material and parts is never allowed to drop to a danger point. Rather than have expediters out chasing down needed stock, the company always has sufficient stock on hand so that there will not be an emergency call for a particular size or gauge sheet. In line with this principle, stock bins are maintained for fittings, duct sections, registers and grilles. These standard items are kept at adequate levels and usually almost all the fittings required for a job can be picked out of the bins. When the shop runs into a slow period, the men are kept busy fabricating these fittings for stock.

In a housing development known as Beverly Terrace, Ruxton obtained a contract for 90 heating plants and at the time the shop was visited about half the jobs had been finished. Installation of these furnaces is done with an eye to future business, however. As can be seen in the photograph, the houses are built with an unfinished attic and Ruxton puts in a heating unit

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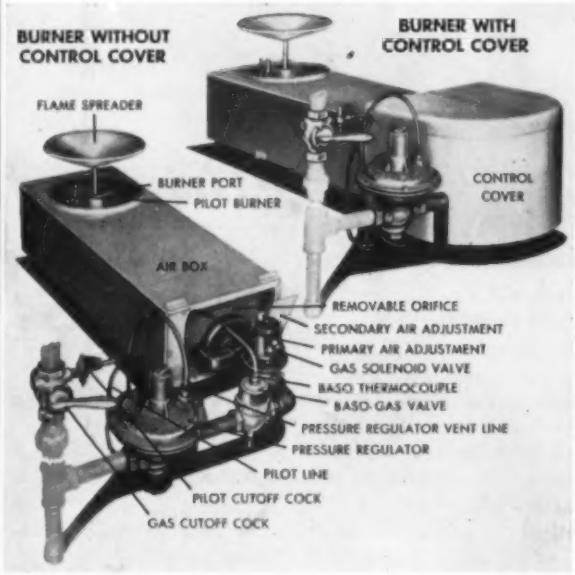

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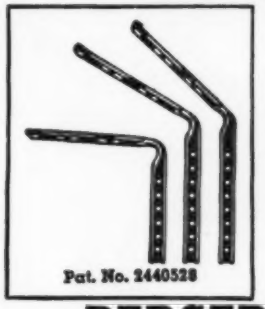

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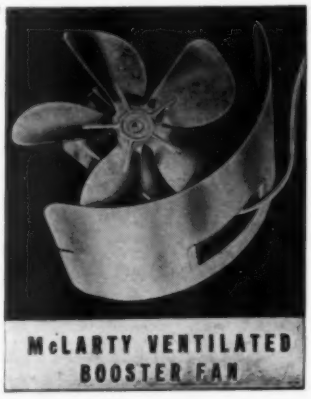

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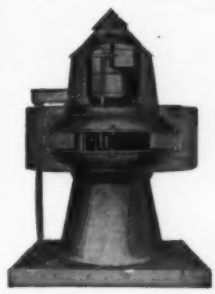

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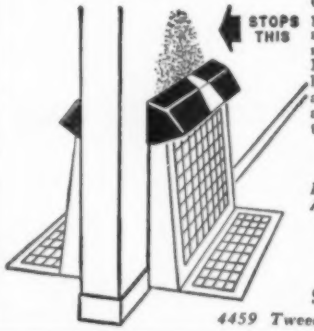

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that is oversized approximately one-third. Then when the owner finishes the attic, the heating plant has ample capacity to handle the additional space.

The company makes a point of installing a riser for the second floor so that no cutting will be necessary when the attic is completed. Riser size is usually 5½ by 12 in. and it is capped when the men leave the job. Location of the riser is marked on the rough flooring in the attic for convenience.

Salesmen for the company have high praise for this method of handling the attic heating since it gives them a ready-made prospect list that is not likely to offer too great an amount of sales resistance. It is possible to offer the home owner attic heating at a reasonable price and still make a good profit on the job.

Several of the homes in this development were roofed by the roofing division of the Ruxton company. This division is housed in a separate building from the heating department and it enables the company to compete on even terms with other heating and sheet metal contractors.

A particularly noticeable characteristic about this company, in all phases of its operation, was the lack of waste motion. Every man had a job to do and knew how he was to do it. Orders were followed through to completion with a minimum of confusion and the various departments worked together with the least possible friction. All of this seemed to stem from the basic idea of, "plan your operations and then follow the plan" that the Ruxton company finds so valuable.

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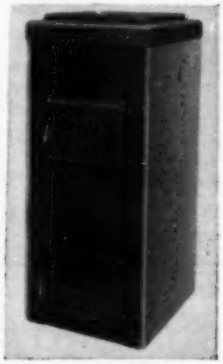

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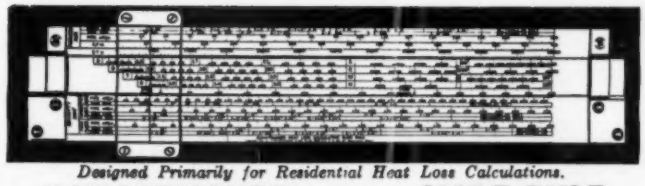

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This snip makes both cuts and bends the lug on the same stroke, leaving the rest of the material straight, ready to enter other work. The lug is 5/32 inch wide and can be cut 1¼ inch deep.

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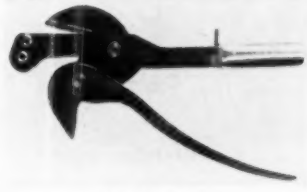

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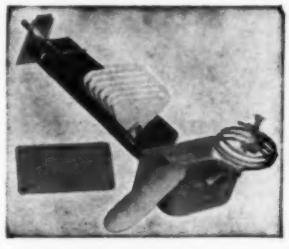

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Los Angeles 21, Calif.

Trinity 4713

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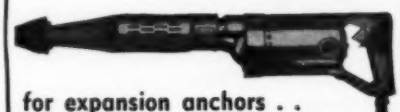

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They will positively prevent down-draft, are simple in design, durably constructed, storm and rain proof.

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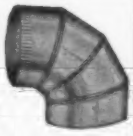

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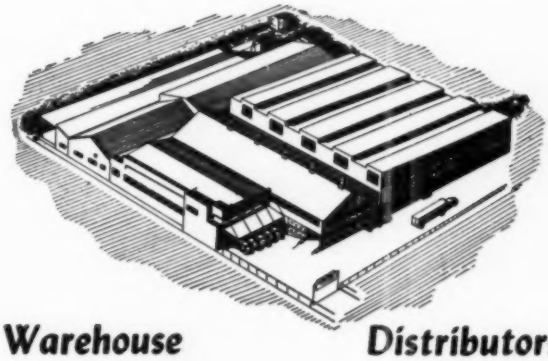
Middle Village, L. I., N. Y.



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- Solders eight hours for 10c
- Right amount of heat
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- Make your own fuel from water and carbide

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PRIME METAL SERVICE
CHICAGO

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General Office and Warehouse — 5800 South Sooley Ave., Chicago 36, Ill.

Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wis.

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CHOSEN AS STANDARD EQUIPMENT BY LEADING MANUFACTURERS

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